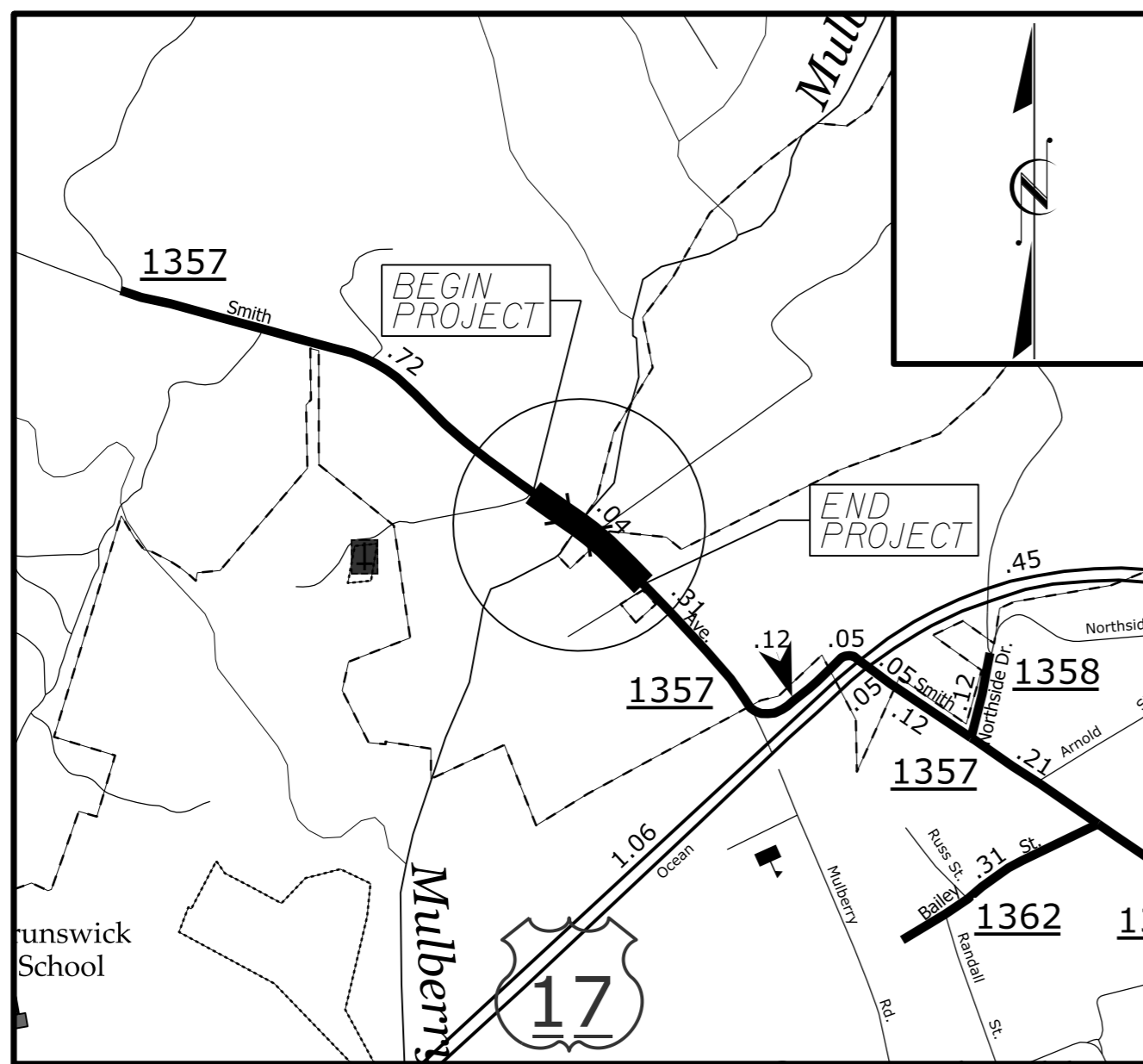


09/08/99

See Sheet I-A For Index of Sheets
See Sheet I-B For Conventional Symbols



VICINITY MAP

N.T.S.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
BRUNSWICK COUNTY

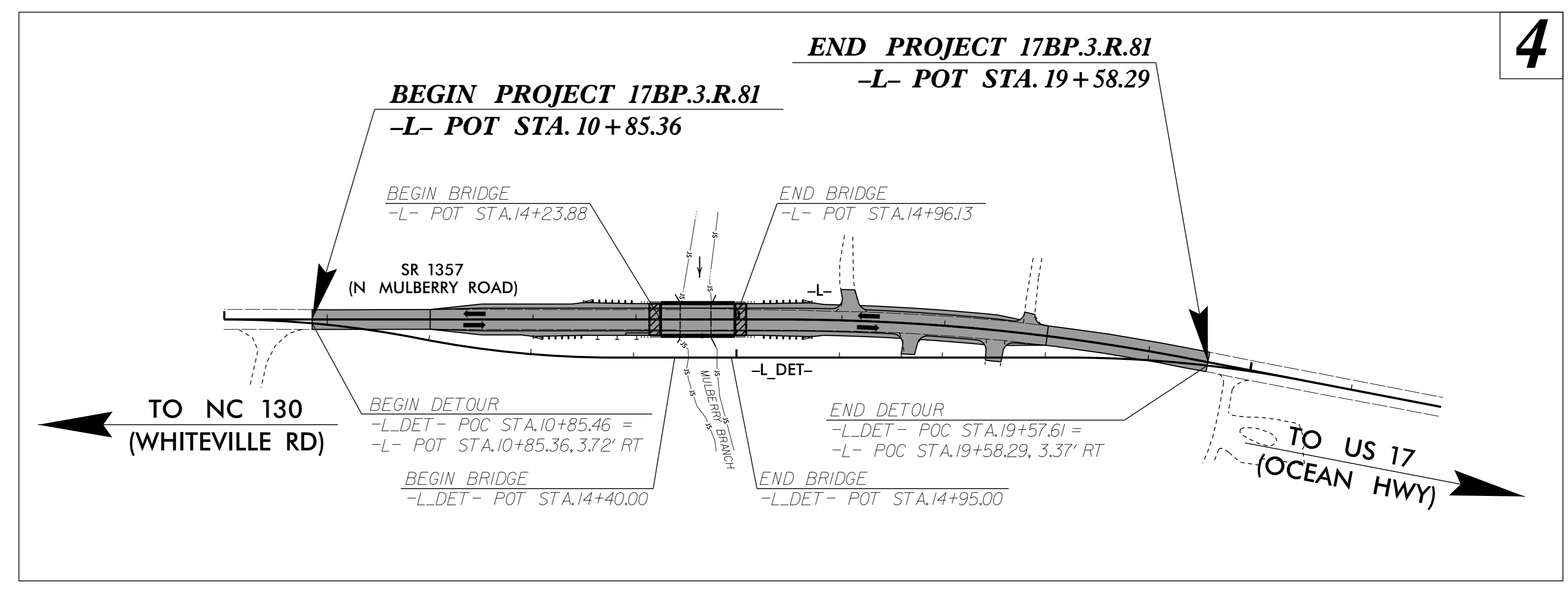
LOCATION: REPLACE BRIDGE 202 OVER MULBERRY BRANCH ON SR 1357 (N MULBERRY ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.3.R.81 (FORMERLY B-5540)	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.3.PE.81	N/A	PE	
17BP.3.ROW.81	N/A	ROWUTIL.	
17BP.3.R.81	N/A	CONST.	

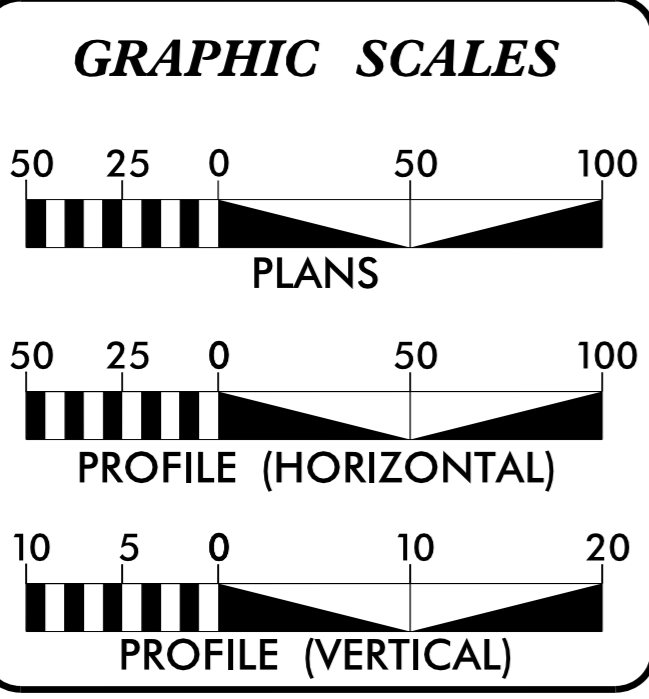
PROJECT: 17BP.3.R.81

CONTRACT: DC00313



4

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA

ADT 2018 =	436 VPD
ADT 2040 =	700 VPD
T =	9%
V =	60 MPH
* TTST =	1% DUAL 8%
FUNC CLASS =	LOCAL
SUB-REGIONAL TIER	

PROJECT LENGTH

LENGTH ROADWAY PROJECT 17BP.3.R.81	=	0.151 MILES
LENGTH BRIDGE PROJECT 17BP.3.R.81	=	0.014 MILES
TOTAL LENGTH PROJECT 17BP.3.R.81	=	0.165 MILES

Prepared in the Office of:
CDM Smith
5400 Glenwood Avenue
Suite 400
Raleigh, NC 27612-3228
NC CDA No. F-1255

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
OCTOBER 22, 2021

LETTING DATE:
MAY 26, 2022

DAVID Z. KEISER, PE
PROJECT ENGINEER

ADAM M. CONRAD, PE
PROJECT DESIGN ENGINEER

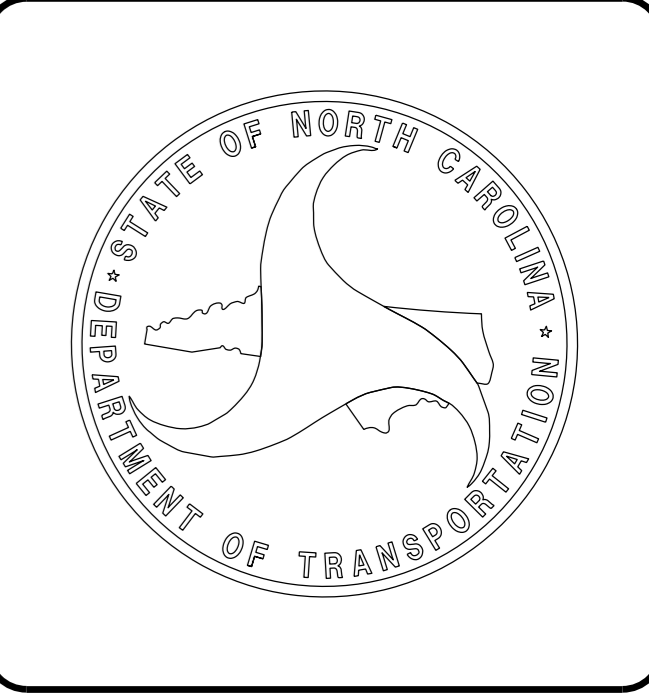
DEREK PIELECH, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

DocuSigned by:
[Signature]
NORTH CAROLINA
3/14/2022
SEAL
046226
JASON M. PATSKORN
P.E.

ROADWAY DESIGN ENGINEER

DocuSigned by:
[Signature]
NORTH CAROLINA
3/14/2022
SEAL
033400
DAVID Z. KEISER
P.E.



-SYSTEME_...Roadway\Proj\B5540_Rdy_Tsh.dgn
USER: CONRADAM

8/17/19

PROJECT REFERENCE NO. <i>17BP.3.R.81</i>	SHEET NO. <i>1-A</i>
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

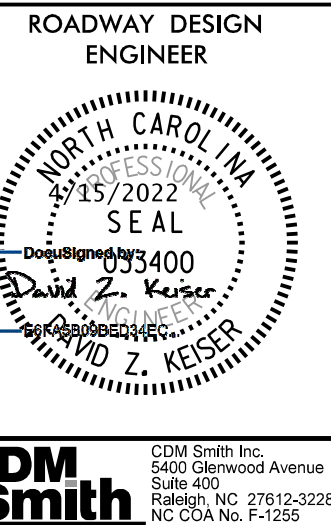
SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES AND STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
2A-1 THRU 2A-3	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B-1	DETOUR DETAIL SHEET
2G-1	GEOTECHNICAL DETAILS
3B-1	ROADWAY SUMMARY
3D-1	DRAINAGE SUMMARY
3G-1	GEOTECHNICAL SUMMARY
4	PLAN AND PROFILE SHEET
RW01 THRU RW04-REV	RIGHT OF WAY PLAN SHEETS
TMP-1 THRU TMP-3	TRANSPORTATION MANAGEMENT PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-7	EROSION CONTROL PLANS
UD-1 THRU UD-2	UTILITIES BY OTHERS PLANS
X-1	CROSS-SECTION SHEET INDEX
X-1A	CROSS-SECTION SUMMARY SHEET
X-2 THRU X-10	CROSS-SECTIONS
S-1 THRU S-14	STRUCTURE PLANS

EFF. 01-16-2018
REV.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Super-elevation - Two Lane Pavement
275.01	Rock Plating (Use Detail in Lieu of Standard)
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.02	Bridge Approach Fills - Type II Modified Approach Fill
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Super-elevated Curve - Method I
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
840.00	Concrete Base Pad for Drainage Structures
840.20	Frames and Wide Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets



GENERAL NOTES: 2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE BRUNSWICK E.M.C.,
AT&T TRANSMISSION, ATMC, AND TOWN OF SHALLOTTE.
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS.

-SYSTEMBEE40_RdL_psh_1A.dgn
11/15/2018 10:00 AM

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

12/2/2016

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○
Computed Property Corner	→
Property Monument	EDM
Parcel/Sequence Number	(123)
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	MLB
Proposed Wetland Boundary	MLB
Existing Endangered Animal Boundary	EAB
Existing Endangered Plant Boundary	EPB
Existing Historic Property Boundary	HPB
Known Contamination Area: Soil	⊗-S-⊗-S-
Potential Contamination Area: Soil	⊗-S-⊗-S-
Known Contamination Area: Water	⊗-W-⊗-W-
Potential Contamination Area: Water	⊗-W-⊗-W-
Contaminated Site: Known or Potential	☠ ?

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○
Well	○
Small Mine	⊗
Foundation	□
Area Outline	□
Cemetery	+
Building	□
School	□
Church	□
Dam	▬

HYDROLOGY:

Stream or Body of Water	-----
Hydro, Pool or Reservoir	▭
Jurisdictional Stream	JS
Buffer Zone 1	BZ 1
Buffer Zone 2	BZ 2
Flow Arrow	←
Disappearing Stream	→
Spring	○
Wetland	▭
Proposed Lateral, Tail, Head Ditch	▬
False Sump	▭

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	CSX TRANSPORTATION MILEPOST 35
Switch	SWITCH
RR Abandoned	-----
RR Dismantled	-----

RIGHT OF WAY & PROJECT CONTROL:

Secondary Horiz and Vert Control Point	◆
Primary Horiz Control Point	○
Primary Horiz and Vert Control Point	◆
Exist Permanent Easement Pin and Cap	◇
New Permanent Easement Pin and Cap	◆
Vertical Benchmark	⊠
Existing Right of Way Marker	△
Existing Right of Way Line	-----
New Right of Way Line	-----
New Right of Way Line with Pin and Cap	-----
New Right of Way Line with Concrete or Granite RW Marker	-----
New Control of Access Line with Concrete C/A Marker	-----
Existing Control of Access	-----
New Control of Access	-----
Existing Easement Line	-----
New Temporary Construction Easement	-----
New Temporary Drainage Easement	-----
New Permanent Drainage Easement	-----
New Permanent Drainage / Utility Easement	-----
New Permanent Utility Easement	-----
New Temporary Utility Easement	-----
New Aerial Utility Easement	-----

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	C
Proposed Slope Stakes Fill	F
Proposed Curb Ramp	CR
Existing Metal Guardrail	T T T
Proposed Guardrail	T T T
Existing Cable Guiderail	□ □ □
Proposed Cable Guiderail	□ □ □
Equality Symbol	⊕
Pavement Removal	⊗

VEGETATION:

Single Tree	☼
Single Shrub	☼

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

Hedge	-----
Woods Line	-----
Orchard	☼ ☼ ☼
Vineyard	Vineyard

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	CONC
Bridge Wing Wall, Head Wall and End Wall	CONC WW
MINOR:	
Head and End Wall	CONC HW
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	CB
Paved Ditch Gutter	-----
Storm Sewer Manhole	⊕
Storm Sewer	S

UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	⊕
Power Line Tower	⊠
Power Transformer	⊠
U/G Power Cable Hand Hole	-----
H-Frame Pole	● ●
U/G Power Line LOS B (S.U.E.*)	-----
U/G Power Line LOS C (S.U.E.*)	-----
U/G Power Line LOS D (S.U.E.*)	-----

TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Pedestal	⊠
Telephone Cell Tower	⊠
U/G Telephone Cable Hand Hole	-----
U/G Telephone Cable LOS B (S.U.E.*)	-----
U/G Telephone Cable LOS C (S.U.E.*)	-----
U/G Telephone Cable LOS D (S.U.E.*)	-----
U/G Telephone Conduit LOS B (S.U.E.*)	-----
U/G Telephone Conduit LOS C (S.U.E.*)	-----
U/G Telephone Conduit LOS D (S.U.E.*)	-----
U/G Fiber Optics Cable LOS B (S.U.E.*)	-----
U/G Fiber Optics Cable LOS C (S.U.E.*)	-----
U/G Fiber Optics Cable LOS D (S.U.E.*)	-----

WATER:

Water Manhole	⊕
Water Meter	○
Water Valve	⊗
Water Hydrant	⊕
U/G Water Line LOS B (S.U.E.*)	-----
U/G Water Line LOS C (S.U.E.*)	-----
U/G Water Line LOS D (S.U.E.*)	-----
Above Ground Water Line	A/G Water

TV:

TV Pedestal	⊠
TV Tower	⊗
U/G TV Cable Hand Hole	-----
U/G TV Cable LOS B (S.U.E.*)	-----
U/G TV Cable LOS C (S.U.E.*)	-----
U/G TV Cable LOS D (S.U.E.*)	-----
U/G Fiber Optic Cable LOS B (S.U.E.*)	-----
U/G Fiber Optic Cable LOS C (S.U.E.*)	-----
U/G Fiber Optic Cable LOS D (S.U.E.*)	-----

GAS:

Gas Valve	◇
Gas Meter	◇
U/G Gas Line LOS B (S.U.E.*)	-----
U/G Gas Line LOS C (S.U.E.*)	-----
U/G Gas Line LOS D (S.U.E.*)	-----
Above Ground Gas Line	A/G Gas

SANITARY SEWER:

Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	SS
Above Ground Sanitary Sewer	A/G Sanitary Sewer
SS Forced Main Line LOS B (S.U.E.*)	-----
SS Forced Main Line LOS C (S.U.E.*)	-----
SS Forced Main Line LOS D (S.U.E.*)	-----

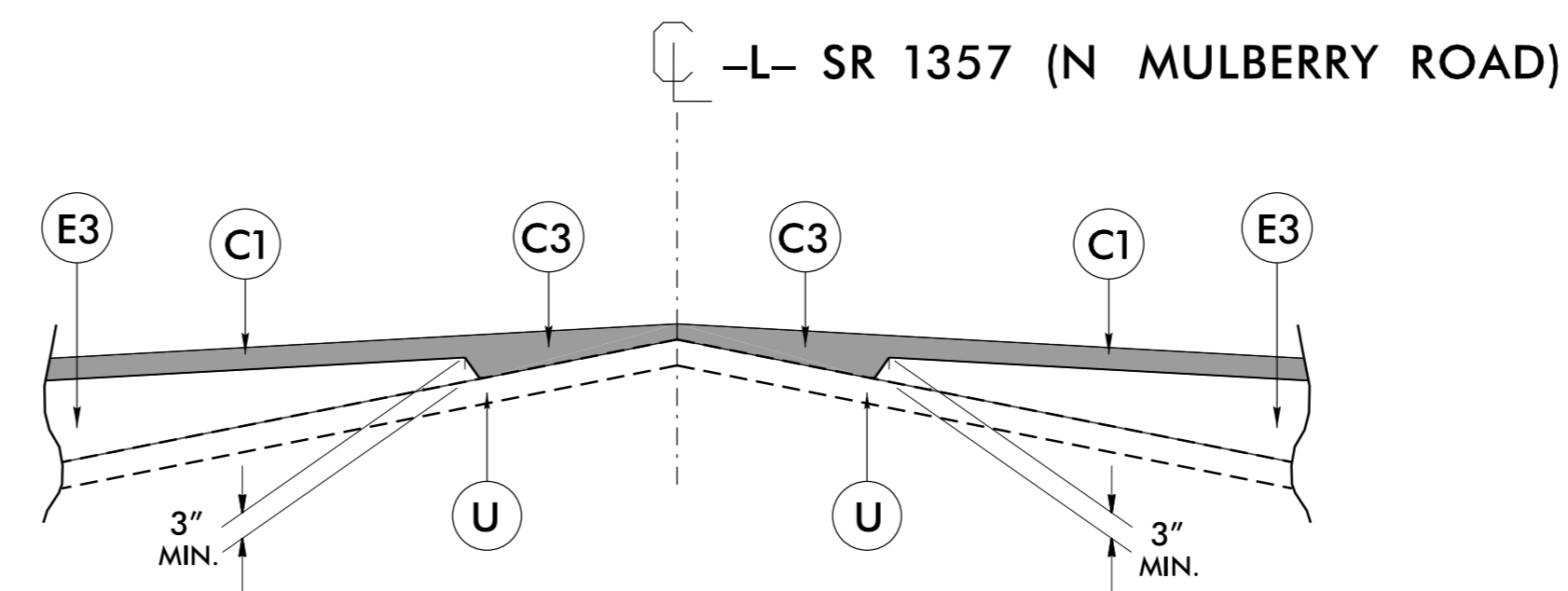
MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊠
Utility Unknown U/G Line LOS B (S.U.E.*)	-----
U/G Tank; Water, Gas, Oil	▭
Underground Storage Tank, Approx. Loc.	UST
A/G Tank; Water, Gas, Oil	▭
Geoenvironmental Boring	⊕
U/G Test Hole LOS A (S.U.E.*)	⊕
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

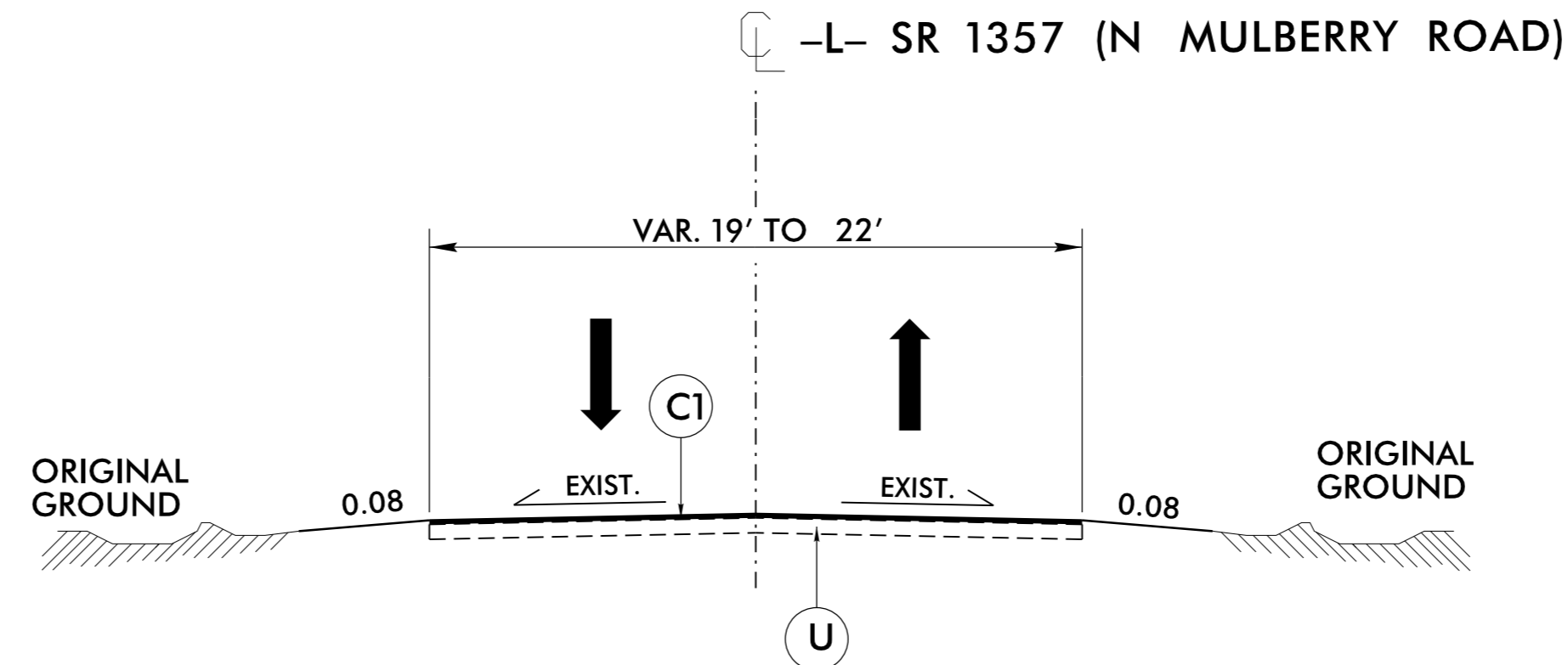
6/2/99

PAVEMENT SCHEDULE <i>(FINAL PAVEMENT DESIGN)</i>	
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 1½" IN DEPTH.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E2	PROP. APPROX. 5½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
J1	PROP. 8" AGGREGATE BASE COURSE
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	INCIDENTAL MILLING
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE -L- WEDGING DETAIL)

NOTE: ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

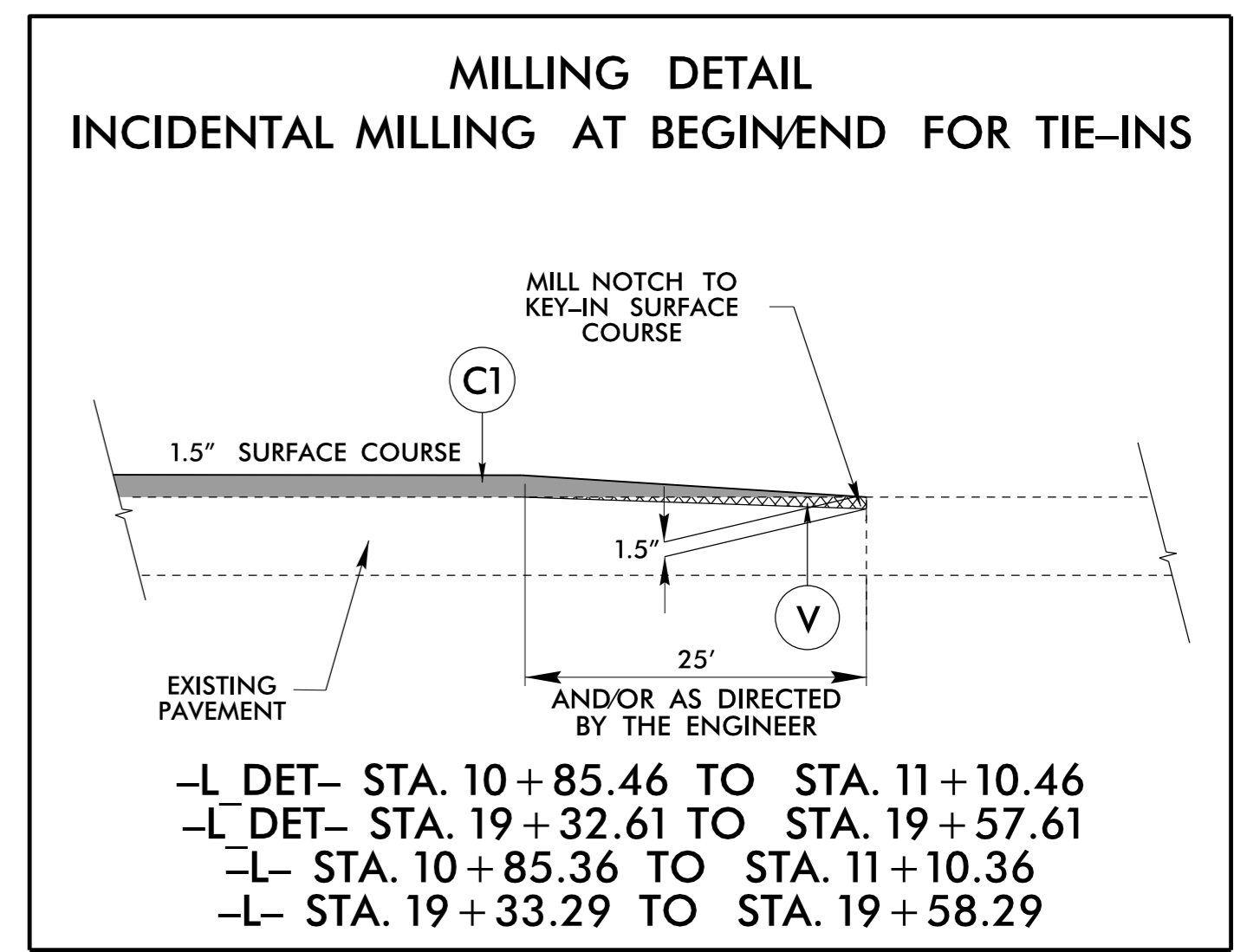


Detail Showing Method Of Wedging - W
-L-



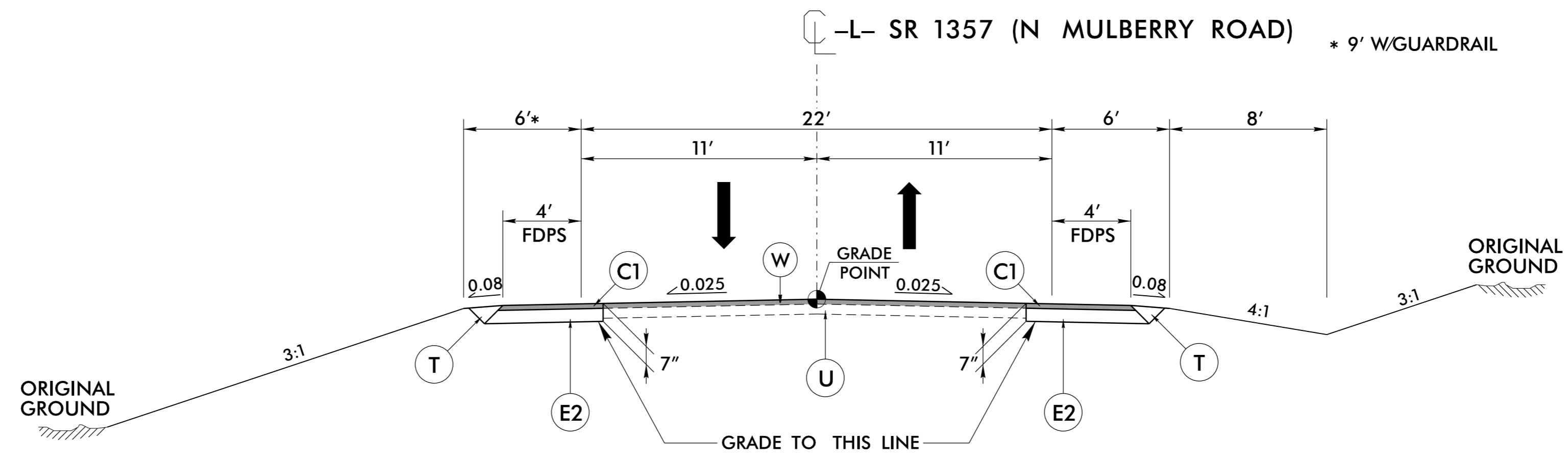
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
-L- STA. 10+85.36 TO 12+00.00
-L- STA. 18+00.00 TO 19+58.29



MILLING DETAIL
INCIDENTAL MILLING AT BEGINEND FOR TIE-INS

-L DET- STA. 10+85.46 TO STA. 11+10.46
-L DET- STA. 19+32.61 TO STA. 19+57.61
-L- STA. 10+85.36 TO STA. 11+10.36
-L- STA. 19+33.29 TO STA. 19+58.29



TYPICAL SECTION NO. 2

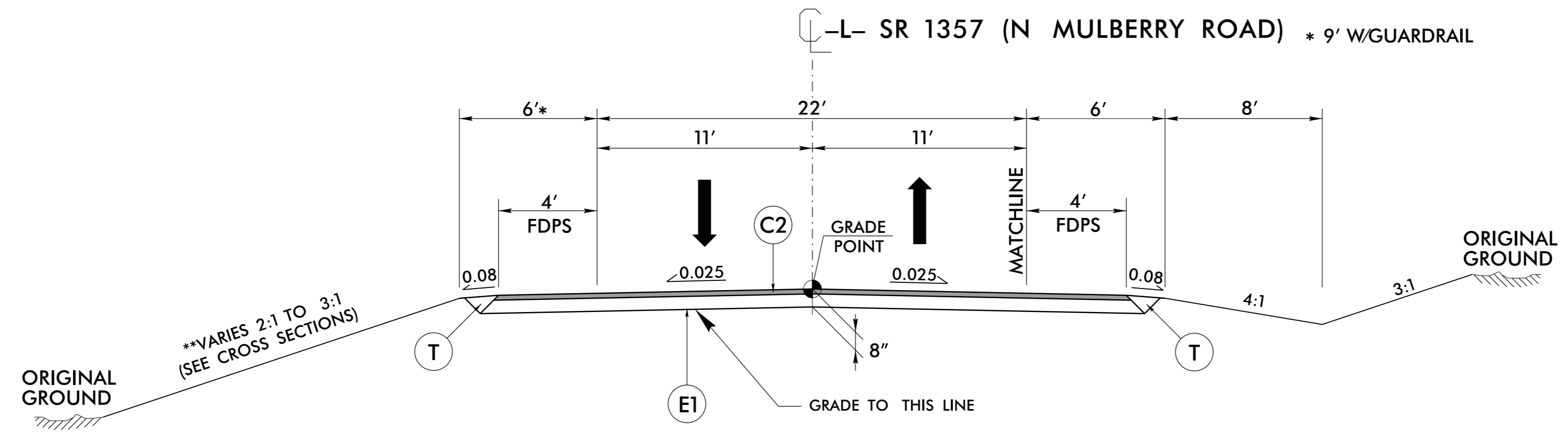
USE TYPICAL SECTION NO. 2
-L- STA. 12+00.00 TO STA. 13+25.00
-L- STA. 15+95.00 TO STA. 18+00.00

PROJECT REFERENCE NO. 17BP.3.R.81	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>	

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6/2/99

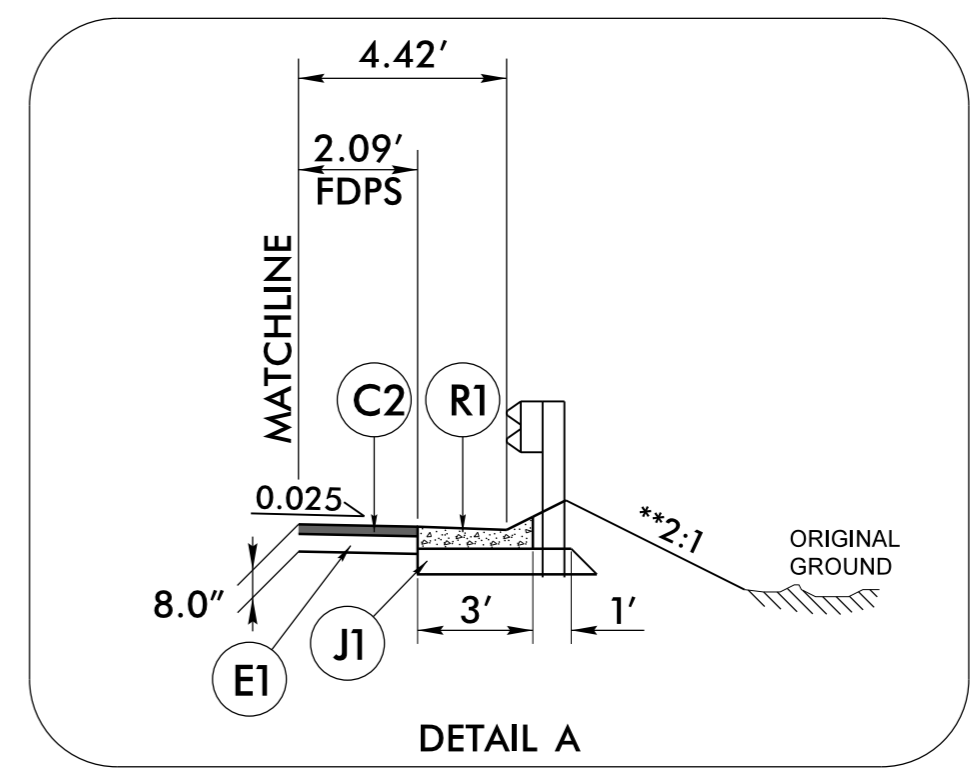
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ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



**NOTE: 2:1 SLOPES USED WITH ROCK PLATING

TYPICAL SECTION NO. 3

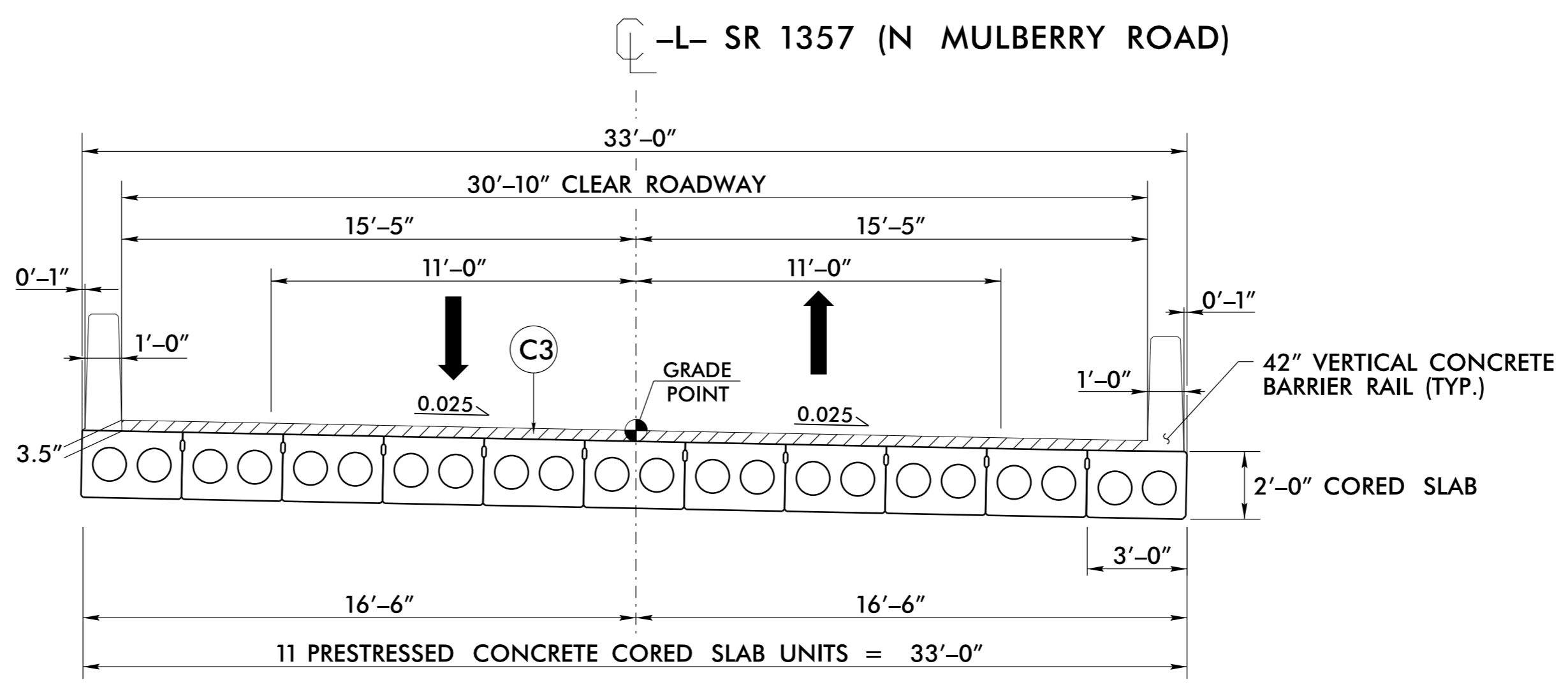
USE TYPICAL SECTION NO. 3
 -L- STA. 13+25.00 TO STA. 14+23.88 (BEGIN BRIDGE)
 -L- STA. 14+96.13 (END BRIDGE) TO STA 15+95.00



USE DETAIL A IN CONJUNCTION WITH TYPICAL SECTION NO. 3
 -L- STA. 13+90.00 TO STA. 14+13.00 (RT)

PAVEMENT SCHEDULE	
FINAL PAVEMENT DESIGN	
C1	1 1/2" S9.5B
C2	3" S9.5B
C3	VAR. S9.5B
E1	5" B25.0C
E2	5 1/2" B25.0C
E3	VAR. B25.0C
J1	8" ABC
R1	SBG
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V	INCIDENTAL MILLING
W	WEDGING

PAVEMENT EDGESLOPES 1:1 UNLESS NOTED OTHERWISE

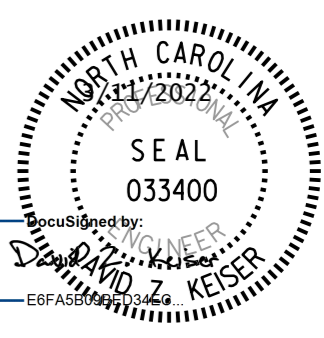



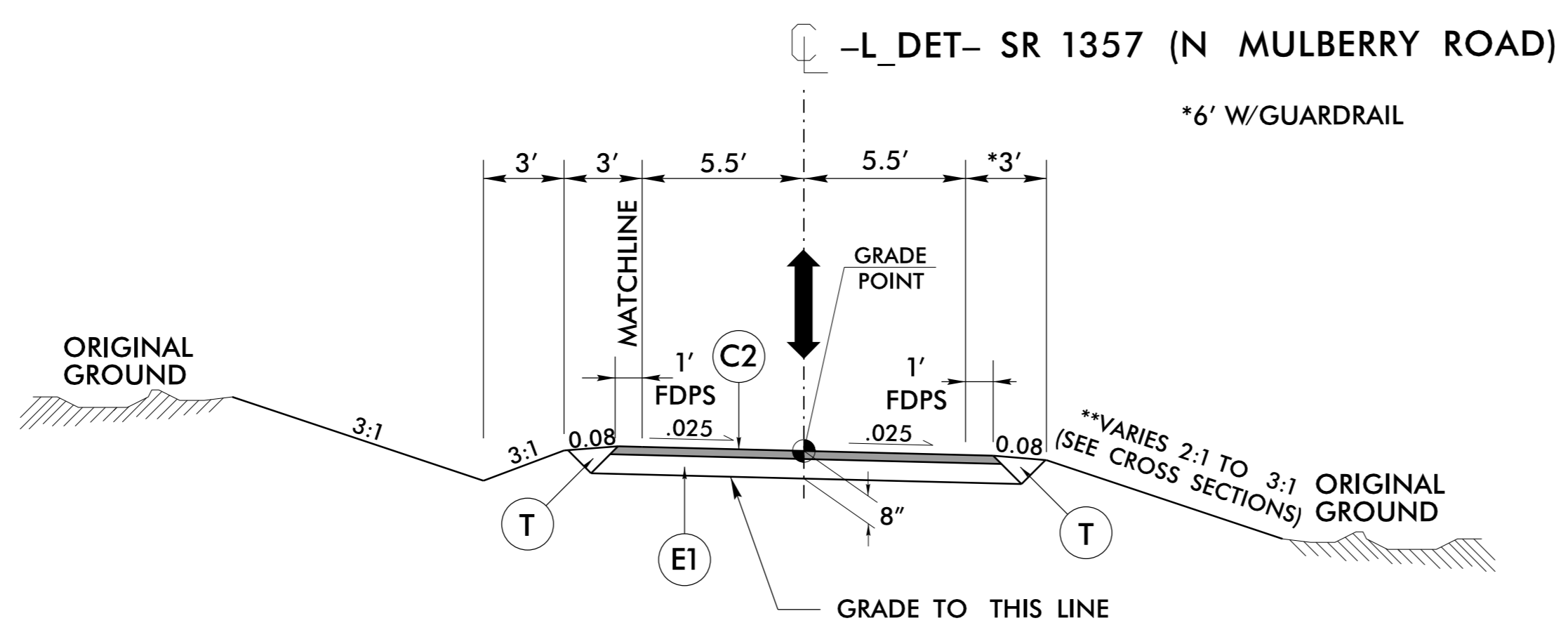
TYPICAL BRIDGE SECTION

USE TYPICAL BRIDGE SECTION
 -L- STA. 14+23.88 (BEGIN BRIDGE) TO STA. 14+96.13 (END BRIDGE)

-SYSTEM- N:\P\10540_B5540_Rdy_tup.dgn
 TITLE: CONSTRUCTION

6/2/99

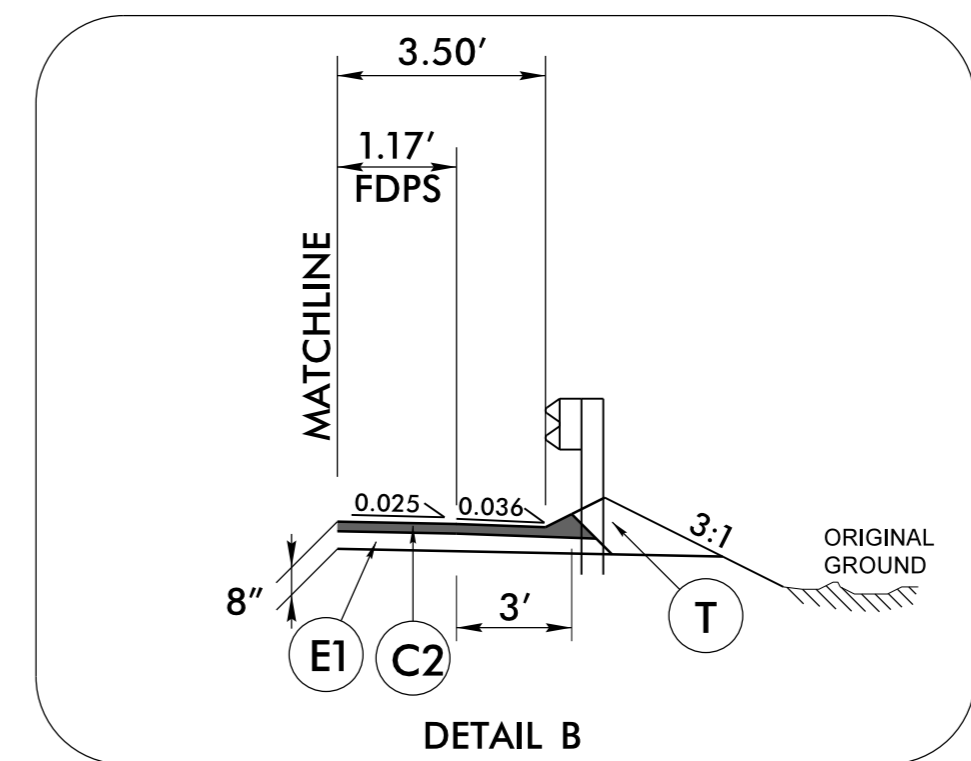
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ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
	
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4

-L_DET- STA. 10+85.46 TO STA. 14+40.00 (BEGIN BRIDGE)
 -L_DET- STA. 14+95.00 (END BRIDGE) TO STA. 19+57.61
 NOTE: THIS IS A ONE LANE - TWO WAY OPERATIONAL DETOUR

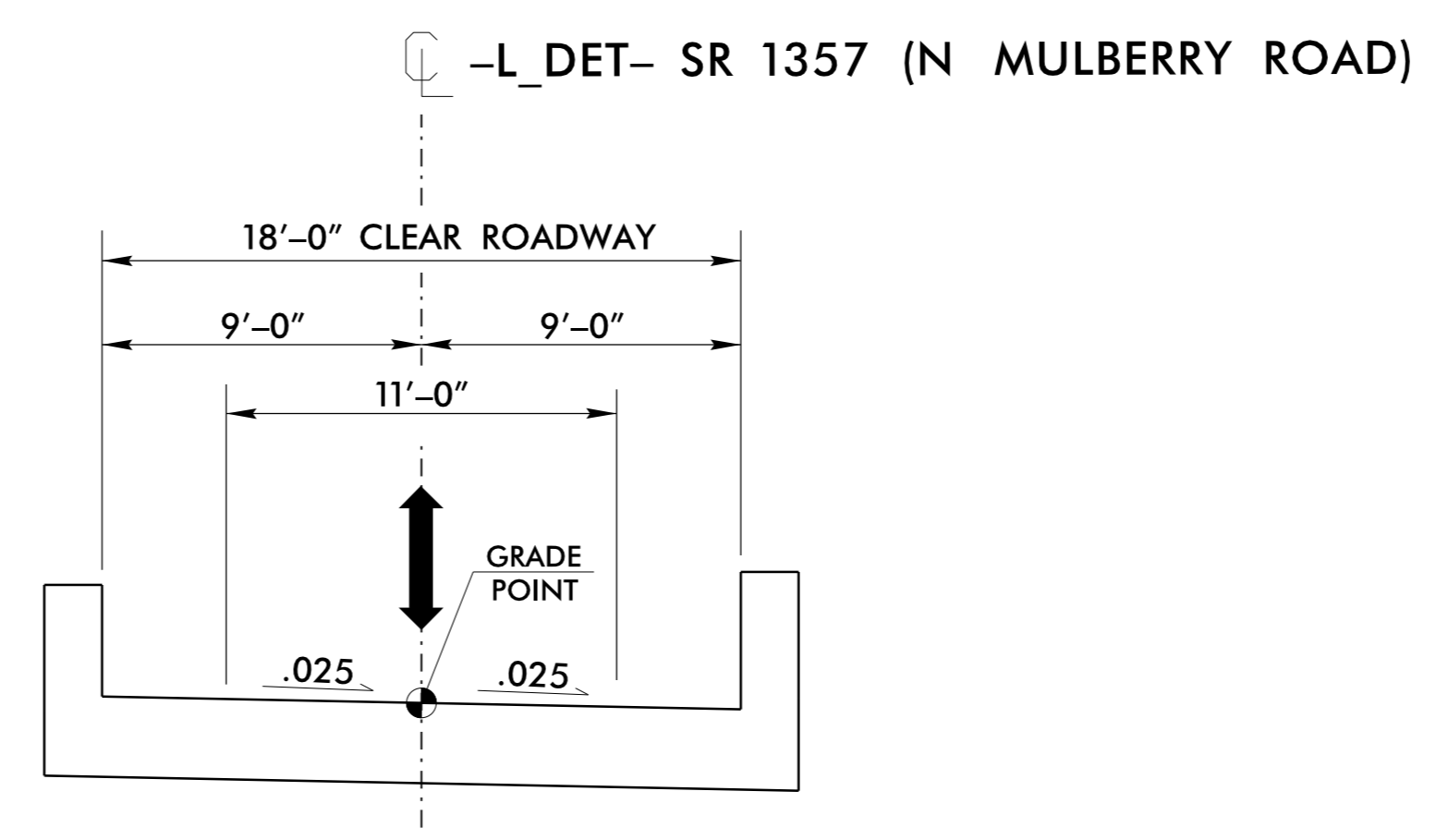


USE DETAIL B IN CONJUNCTION WITH TYPICAL SECTION NO. 4

-L_DET- STA. 14+26.00 TO STA. 14+40.00 (RT)

PAVEMENT SCHEDULE	
FINAL PAVEMENT DESIGN	
C1	1 1/2" S9.5B
C2	3" S9.5B
C3	VAR. S9.5B
E1	5" B25.0C
E2	5 1/2" B25.0C
E3	VAR. B25.0C
J1	8" ABC
R1	SBG
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V	INCIDENTAL MILLING
W	WEDGING

PAVEMENT EDGESLOPES 1:1 UNLESS NOTED OTHERWISE



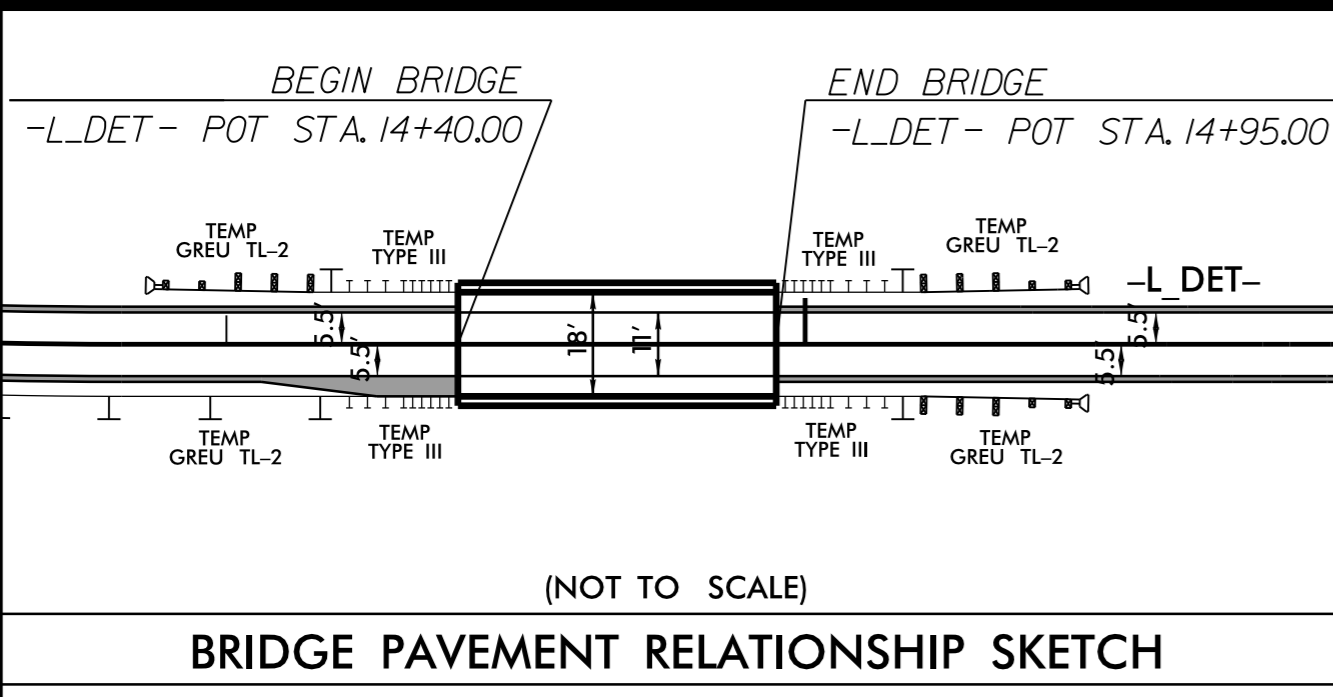
TYPICAL DETOUR BRIDGE SECTION

USE TYPICAL DETOUR BRIDGE SECTION

-L_DET- STA. 14+40.00 TO STA. 14+95.00
 NOTE: THIS IS A ONE LANE - TWO WAY OPERATIONAL DETOUR

-SYSTEM- N:\P\105\B5540_Rdy_tup.dgn
 J:\E\105\B5540_Rdy_tup.dgn

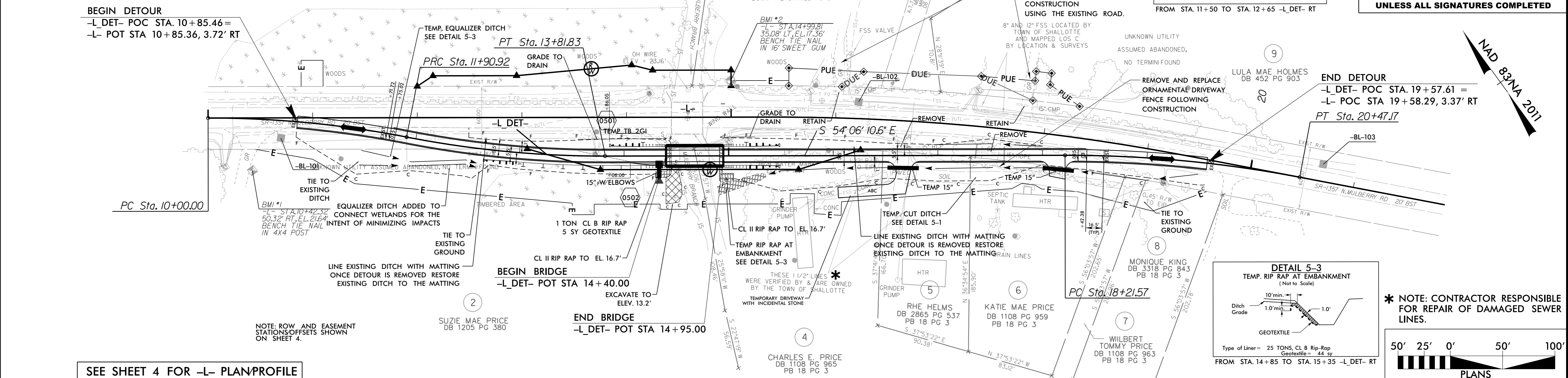
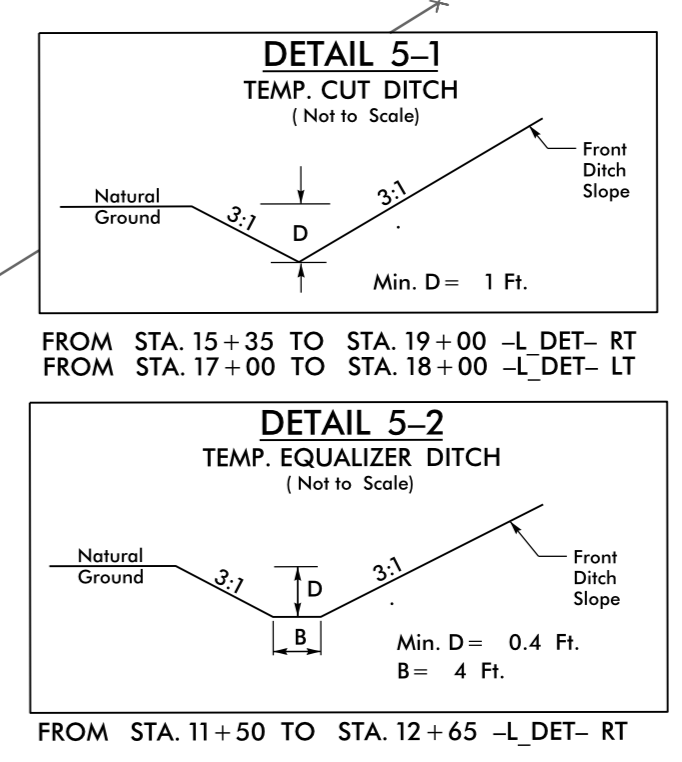
PROJECT REFERENCE NO. 17BP.3.R.81	SHEET NO. 2B-1
ROADWAY DESIGN ENGINEER SEAL 033400	HYDRAULICS ENGINEER SEAL 046226
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



-L-DET-

PI Sta 10+95.76 $\Delta = 11' 08" 20.9" (RT)$ $D = 5' 50" 04.6"$ $L = 190.92'$ $T = 95.76'$ $R = 982.00'$ $e = NC$ $RO = 49.5'$ $DS = 15mph$	PI Sta 12+86.67 $\Delta = 11' 08" 20.9" (LT)$ $D = 5' 50" 04.6"$ $L = 190.92'$ $T = 95.76'$ $R = 982.00'$ $e = NC$ $RO = 49.5'$ $DS = 15mph$	PI Sta 19+34.71 $\Delta = 10' 51" 44.7" (RT)$ $D = 4' 48" 53.2"$ $L = 225.61'$ $T = 113.14'$ $R = 1,190.00'$ $e = 0.04$ $RO = 76'$ $DS = 55mph$
--	--	---

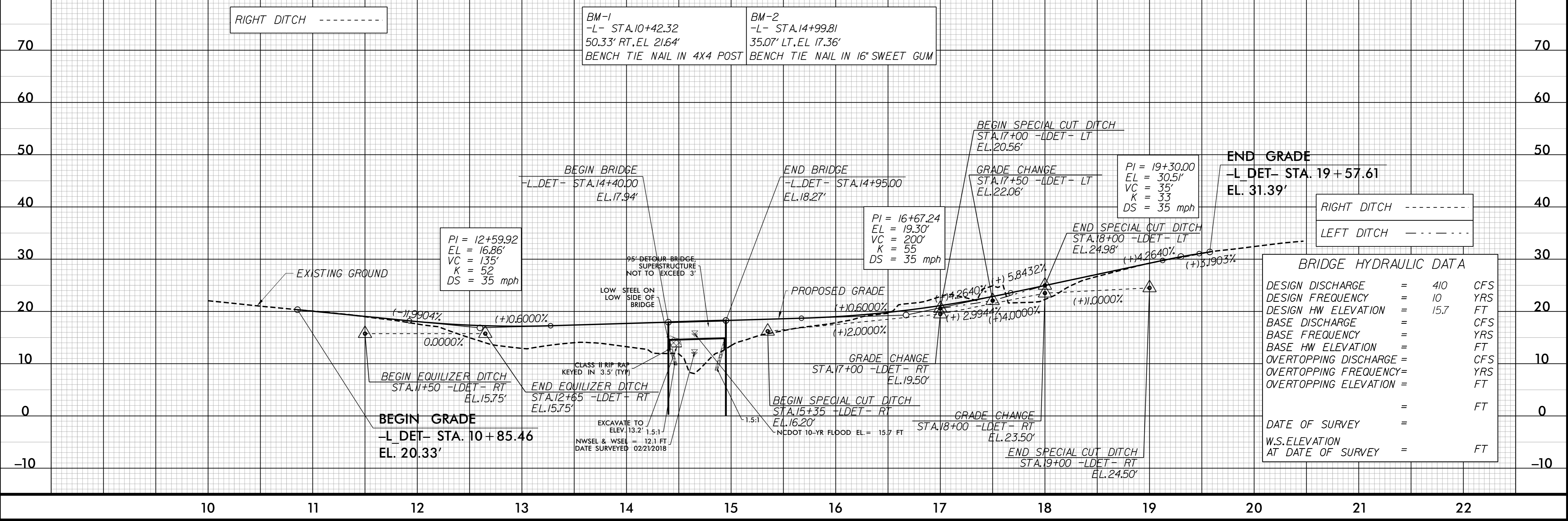
DETOUR DETAIL



*** NOTE: CONTRACTOR RESPONSIBLE FOR REPAIR OF DAMAGED SEWER LINES.**

50' 25' 0' 50' 100'
PLANS

SEE SHEET 4 FOR -L- PLANPROFILE



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	410	CFS
DESIGN FREQUENCY	=	10	YRS
DESIGN HW ELEVATION	=	15.7	FT
BASE DISCHARGE	=		CFS
BASE FREQUENCY	=		YRS
BASE HW ELEVATION	=		FT
OVERTOPPING DISCHARGE	=		CFS
OVERTOPPING FREQUENCY	=		YRS
OVERTOPPING ELEVATION	=		FT
DATE OF SURVEY	=		FT
W.S. ELEVATION AT DATE OF SURVEY	=		FT

REVISIONS

-SYSTEM: 02/21/2018 10:00 AM - d:\psh-281.dgn

GEOTECHNICAL ENGINEER

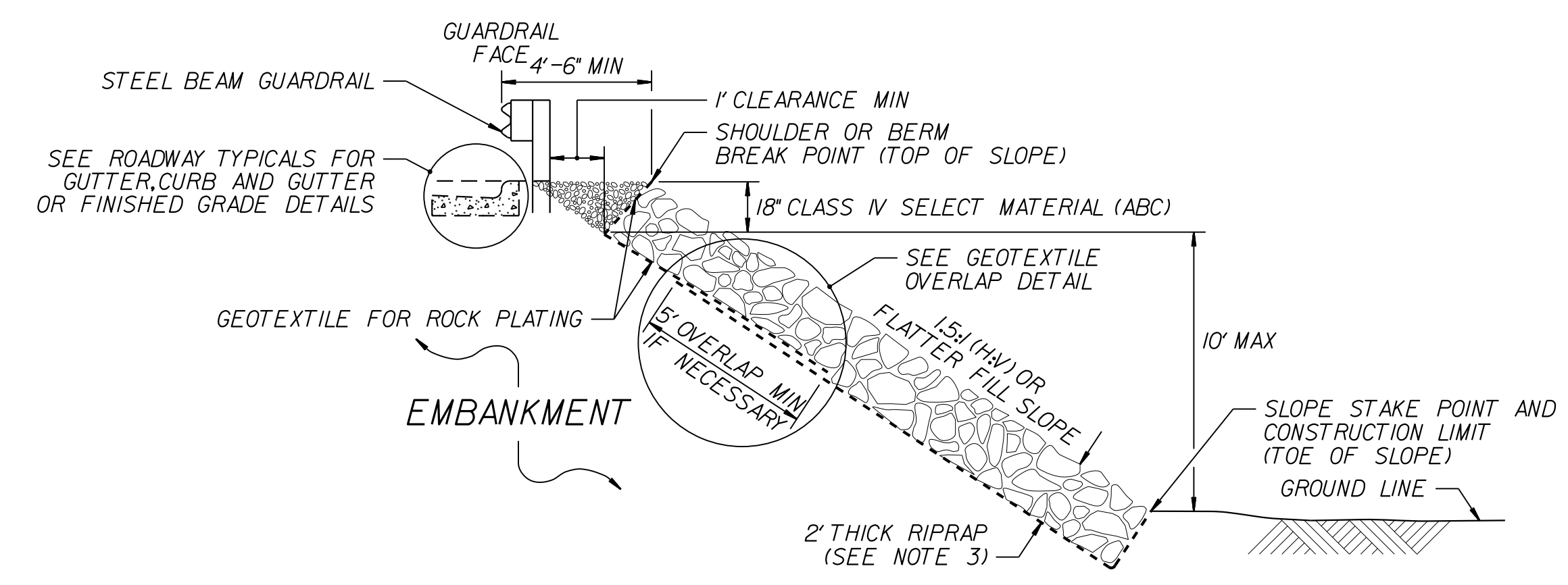
ENGINEER

DocuSigned by: *Jinyoung Park* 02/28/2022

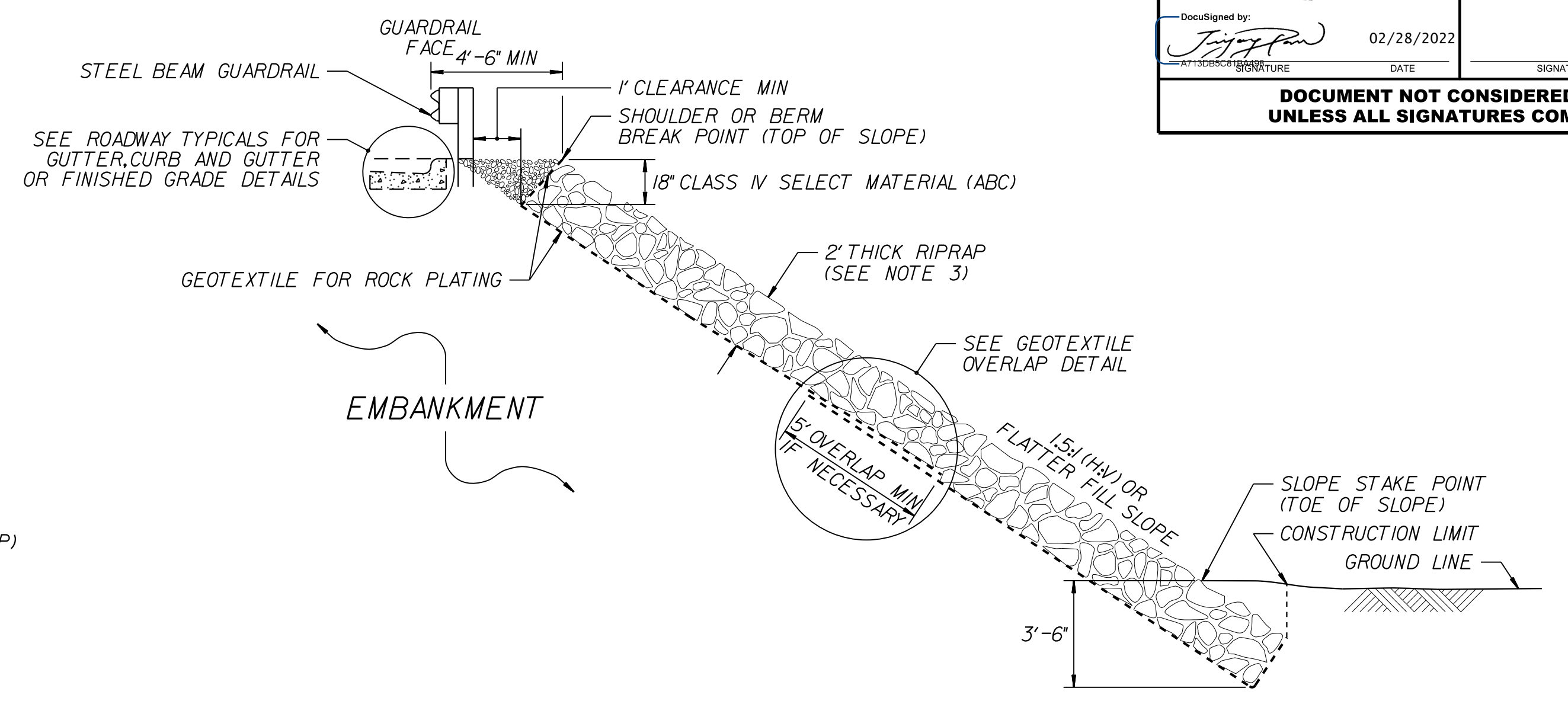
DATE: 02/28/2022

SIGNATURE: _____ DATE: _____

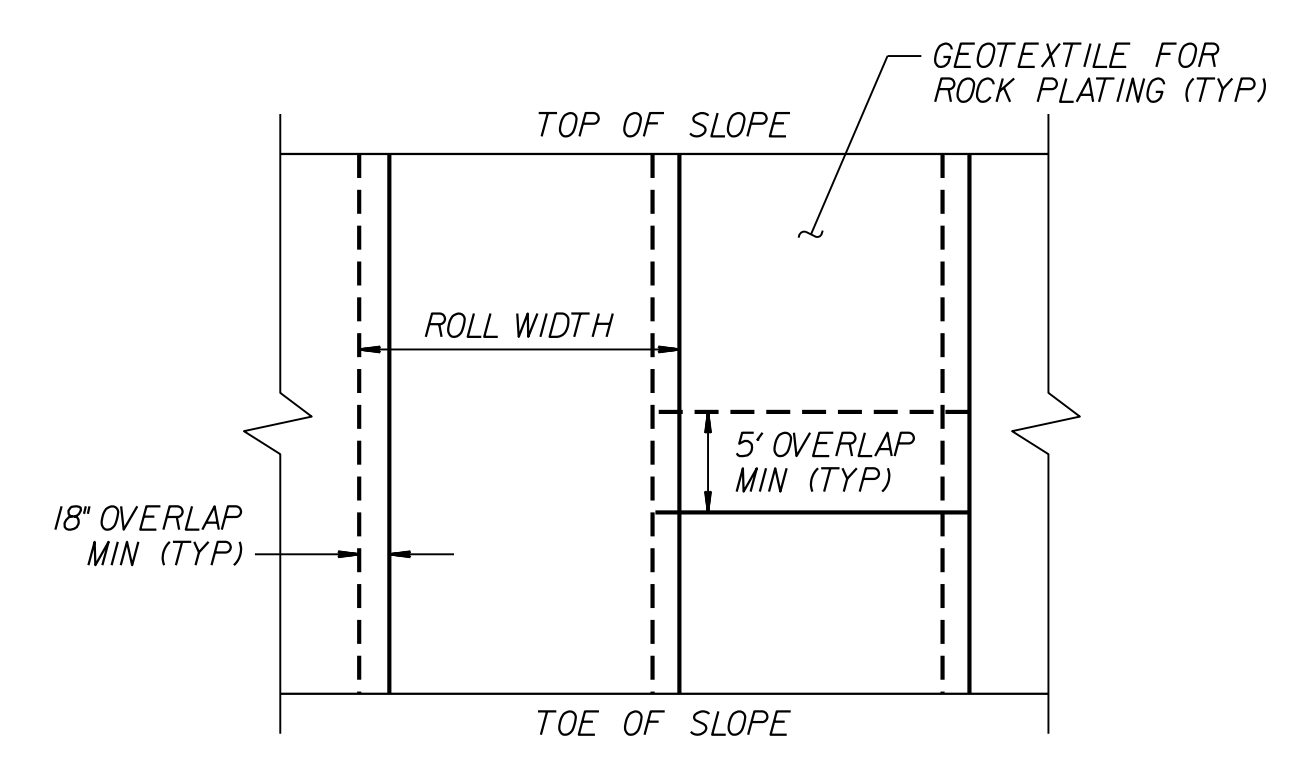
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



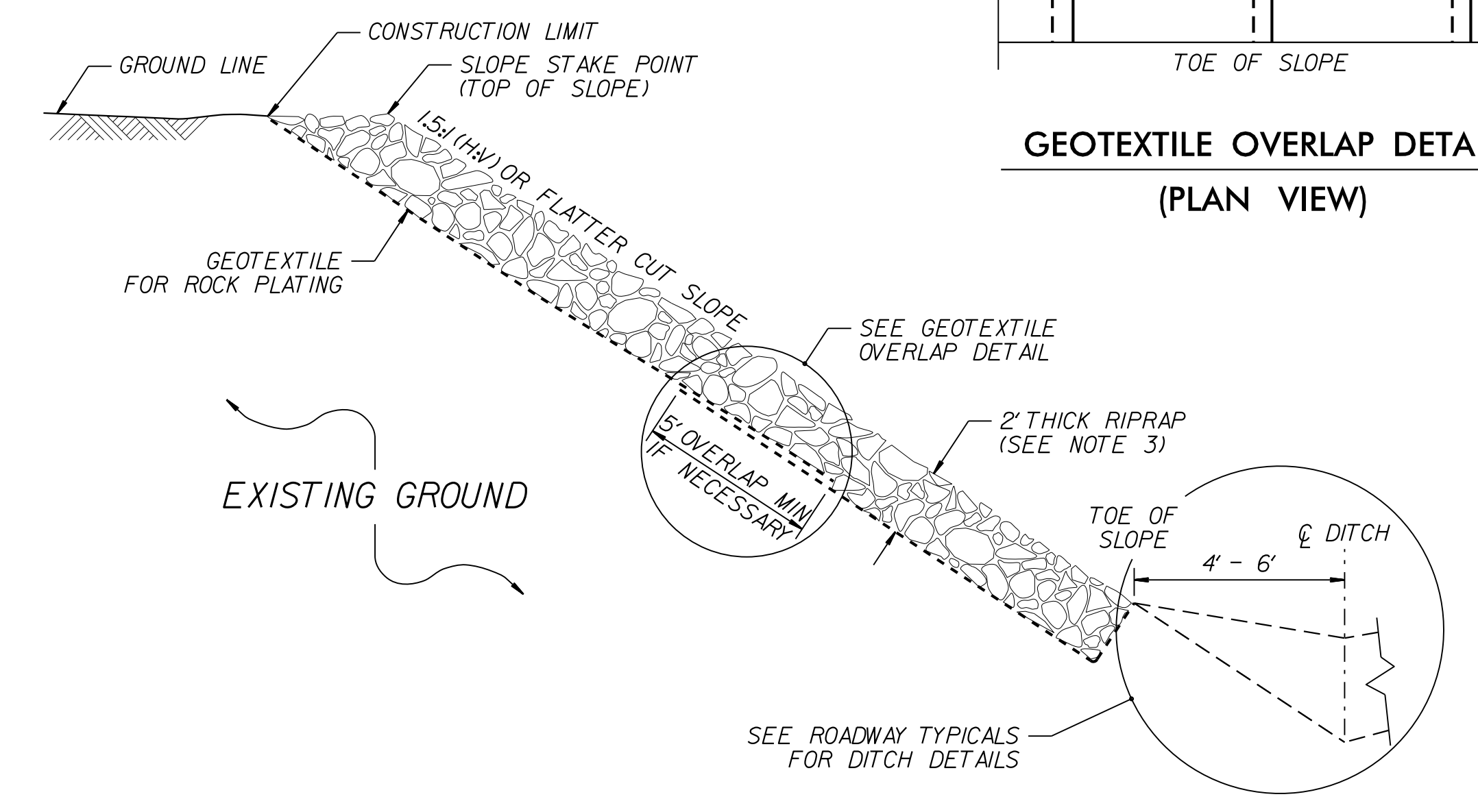
ROCK PLATING DETAIL NO. 1 – TYPICAL SECTION



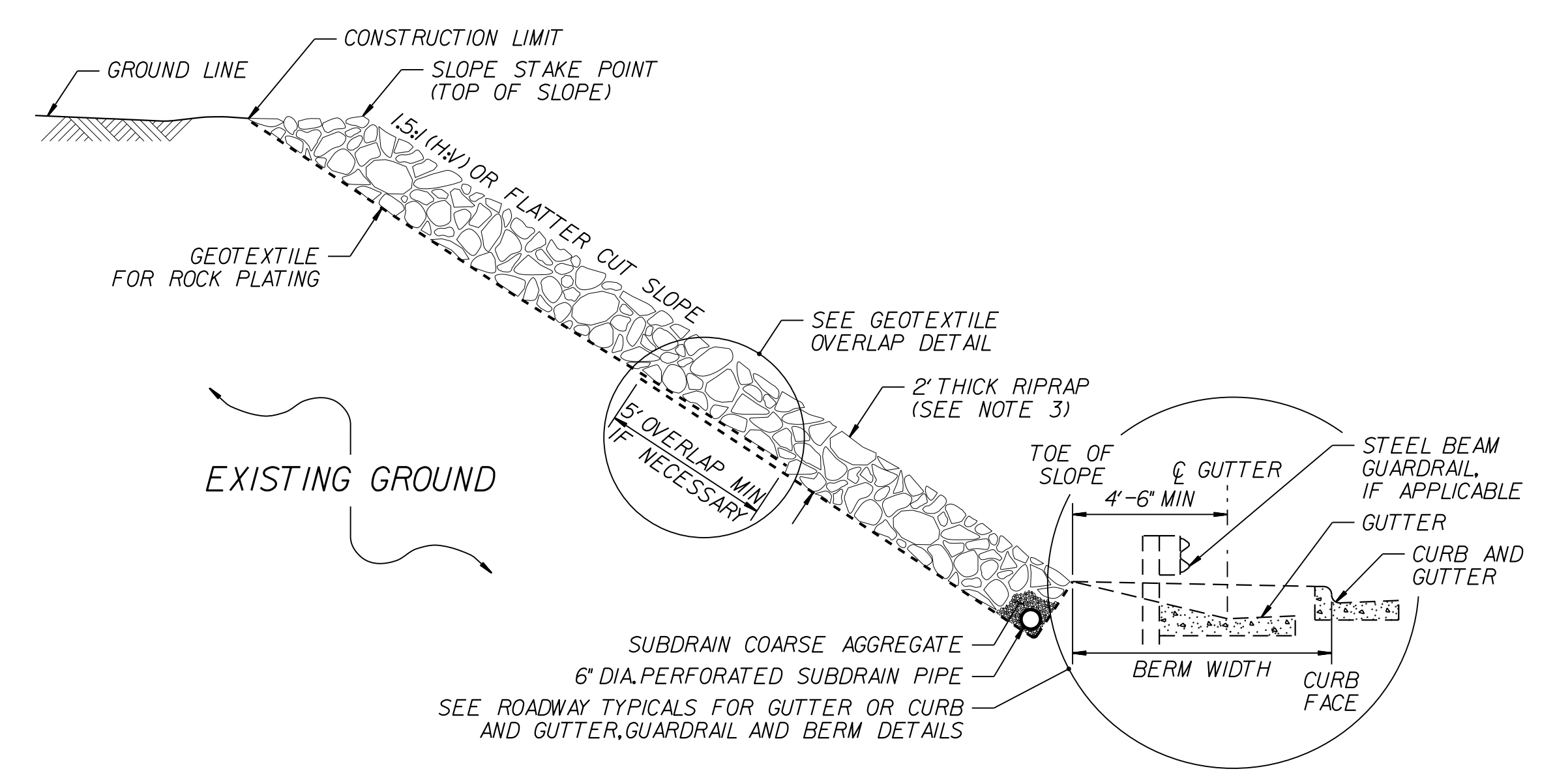
ROCK PLATING DETAIL NO. 2 – TYPICAL SECTION



GEOTEXTILE OVERLAP DETAIL (PLAN VIEW)



ROCK PLATING DETAIL NO. 3 – TYPICAL SECTION



ROCK PLATING DETAIL NO. 4 – TYPICAL SECTION

- NOTES:**
- SEE ROADWAY PLANS AND SUMMARY SHEETS FOR ROCK PLATING LOCATIONS.
 - FOR ROCK PLATING, SEE ROCK PLATING (SPECIAL) PROVISION.
 - USE CLASS I, 2 OR B RIPRAP UNLESS REQUIRED OTHERWISE IN THE ROADWAY SUMMARY SHEETS.

PREPARED BY: JINYOUNG PARK	DATE: 02/2022
REVIEWED BY: JAMEY BATTS	DATE: 02/2022

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

MODIFIED STANDARD ROCK PLATING DETAILS

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
 TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
 FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
 W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
 G = GATING IMPACT ATTENUATOR TYPE 350
 NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS				IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS	
				STRAIGHT	TEMP	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU TL-3	TYPE III	TEMP GREU TL-2	TEMP TYPE III	EA	G	NG					
-L-	13+00.00	14+23.88	RT	123.88			14+23.88		4.42	7.42	50.00		1.00		1	1										
-L-	13+48.88	14+23.88	LT	75.00				14+23.88	4.42	7.42		50.00		1.00	1	1										
-L-	14+96.13	15+71.13	RT	75.00				14+96.13	4.42	7.42		50.00		1.00	1	1										
-L-	14+96.13	15+71.13	LT	75.00			14+96.13		4.42	7.42	50.00		1.00		1	1										
-L_DET-	12+66.30	14+40.00	RT		173.70		14+40.00		3.50	6.50	25.00		1.00			1	1									
-L_DET-	13+86.09	14+40.00	LT		50.00			14+40.00	3.50	6.50		25.00		1.00		1	1									
-L_DET-	14+95.00	15+48.95	RT		50.00			14+95.00	3.50	6.50		25.00		1.00		1	1									
-L_DET-	14+95.00	15+48.95	LT		50.00		14+95.00		3.50	6.50	25.00		1.00			1	1									
			SUBTOTALS	348.88	323.70										4	4	4	4								
			TYPE III, 4@18.75'	-75.00																						
			GREU TL-3, 4@50.00'	-200.00																						
			TEMP TYPE III, 4@18.75'		-75.00																					
			TEMP GREU TL-2, 4@25.00'		-100.00																					
			PROJECT TOTALS	75.00	150.00										4	4	4	4								
			SAY	75.00	150.00										4	4	4	4								

ADDITIONAL GUARDRAIL POSTS = 10 EA

SUMMARY OF EARTHWORK (CY)

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
-L- 12+00.00 - 14+23.88	5		354	348	
-L- 14+96.13 - 18+00.00	73		257	184	
-L_DET- 10+85.46 - 14+40.00	64		778	714	
-L_DET- 14+95.00 - 19+57.61	841		585		254
SUBTOTAL	983		1,975	1,246	254
DETOUR REMOVAL					
-L_DET- 10+85.46 - 14+40.00	710		40		
-L_DET- 14+95.00 - 19+57.61	466		917	451	
SUBTOTAL	1,176		957	451	
WASTE IN LIEU OF BORROW				-254	-254
PROJECT TOTAL	2,159		2,932	1,443	
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				72	
GRAND TOTAL	2,159		2,932	1,515	
SAY	2,200			1,600	

UNDERCUT (CONTIGENCY) = 300 CY
 SELECT GRANULAR MATERIAL, CLASS III (CONTIGENCY) = 300 CY

NOTE: Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

SUMMARY OF SHOULDER BERM GUTTER (LF)

SURVEY LINE	STATION	STATION	LENGTH
-L- RT	13+90.00	14+13.00	23.00
		TOTAL:	23.00
		SAY:	30

SUMMARY OF PAVEMENT REMOVAL (SY)

LINE	STATION - STATION	LOCATION	REMOVAL (SY)
-L-	STA. 13+25 TO STA. 14+43	CL	255
-L-	STA. 14+73 TO STA. 15+95	CL	268
-L_DET-	STA. 10+85 TO STA. 14+40	CL	458
-L_DET-	STA. 14+95 TO STA. 19+58	CL	716
GRAND TOTAL			1,697
SAY			1,700

6/21/00
 -SYTIME REF: 40_RdJ-sum_3B-1.dgn
 11:55:00 AM 8/16/2021

SUMMARY OF SUBSURFACE DRAINAGE (LF)

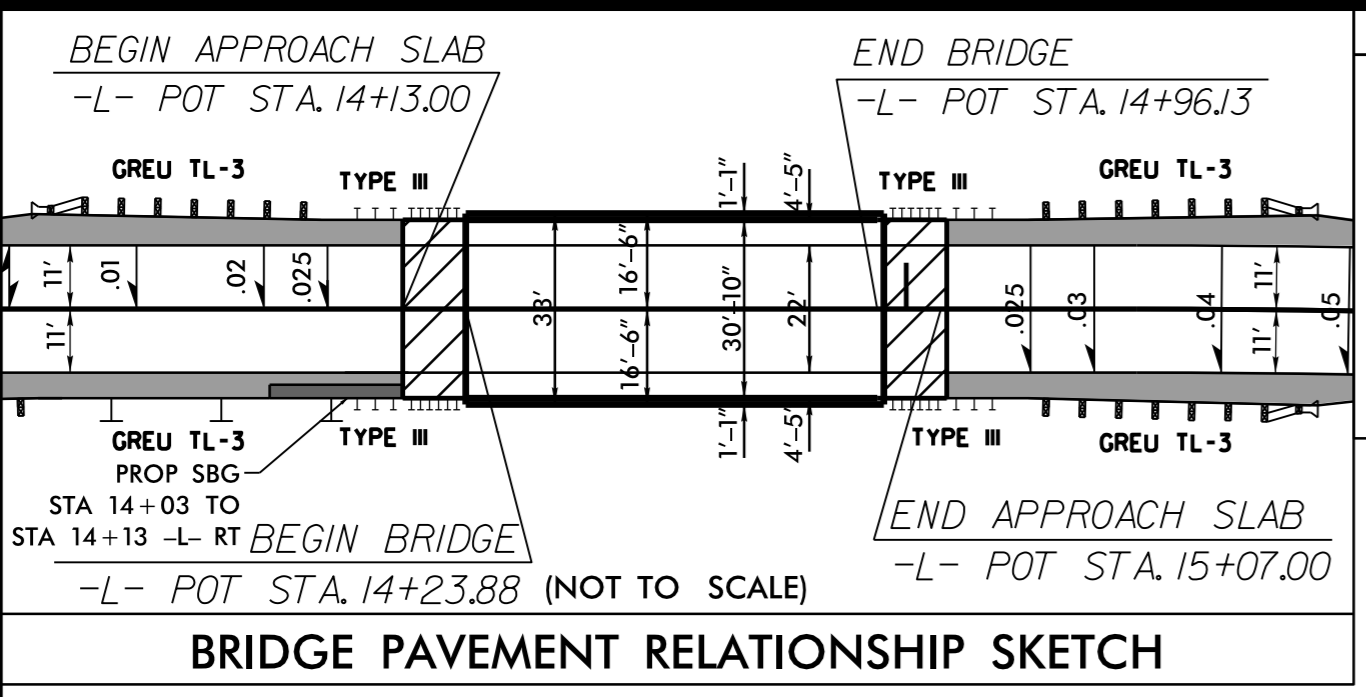
SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	DRAIN TYPE* UD/BD/SD	LF
CONTINGENCY				SD	200
				TOTAL:	200
				SAY:	200

*UD = UNDERDRAIN
 *BD = BLIND DRAIN
 *SD = SUBSURFACE DRAIN

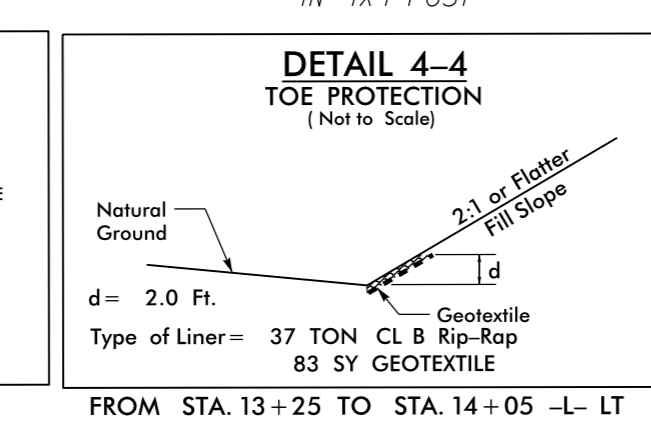
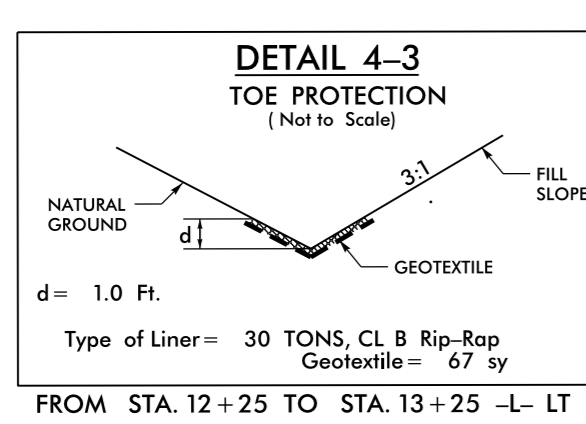
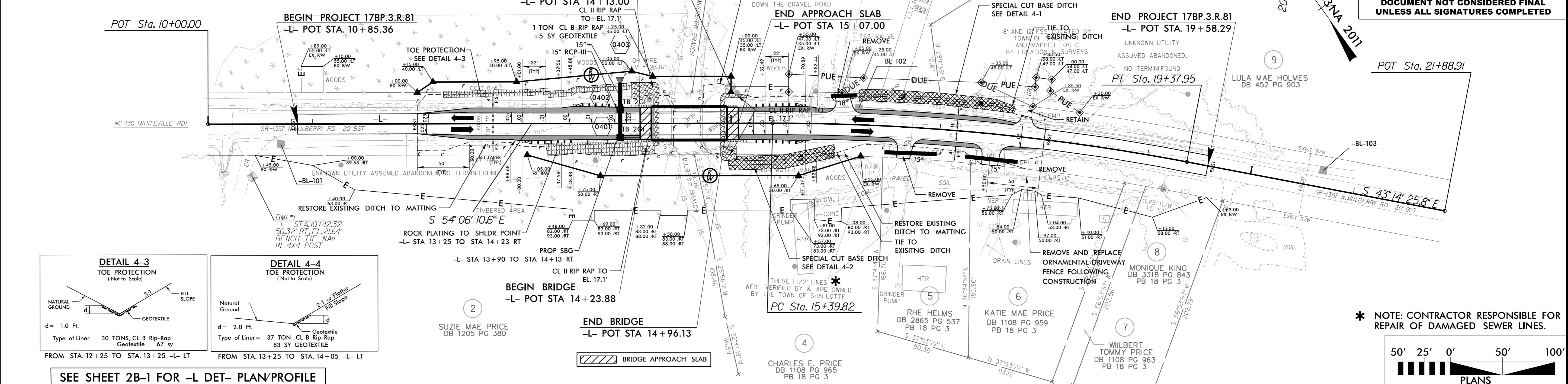
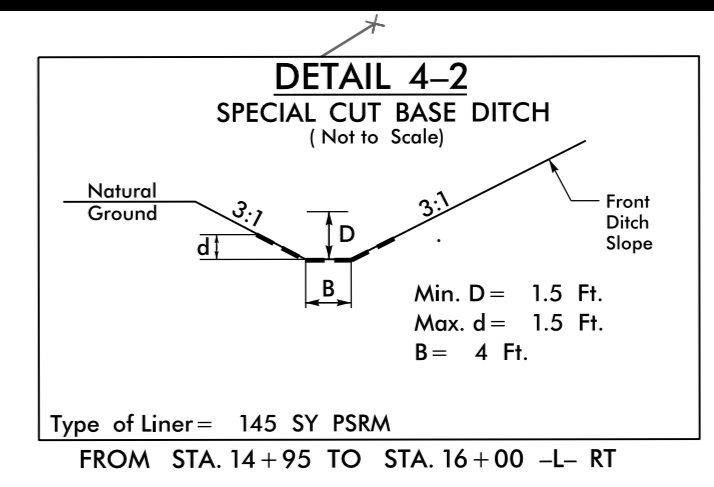
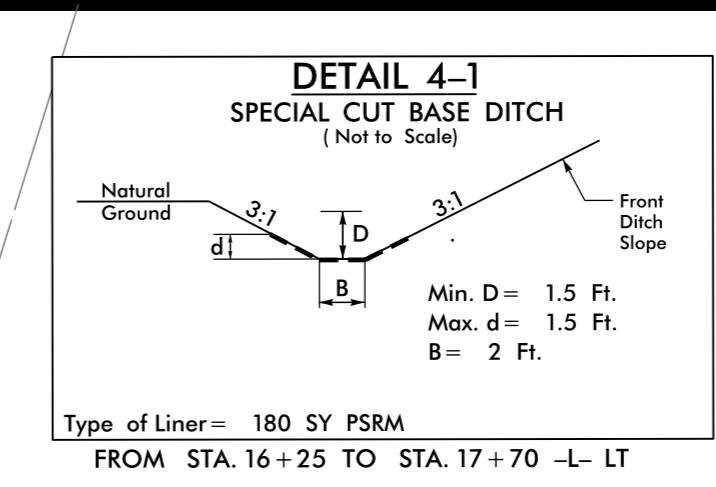
SUMMARY OF ROCK PLATING (SY)

SURVEY LINE	BEGINNING SLOPE (H:V)	APPROX. STATION	ENDING SLOPE (H:V)	APPROX. STATION	LOCATION LT/RT	ROCK PLATING DETAIL NO. 1/2/3/4	RIP RAP CLASS* 1/2/B	ROCK PLATING SY
-L-	2.5:1	13+25	2:1	14+23	RT	1		110
							TOTAL:	110
							SAY:	110

PROJECT REFERENCE NO. 17BP.3.R.81	SHEET NO. 4
ROADWAY DESIGN ENGINEER SEAL 033400	HYDRAULICS ENGINEER SEAL 053755
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



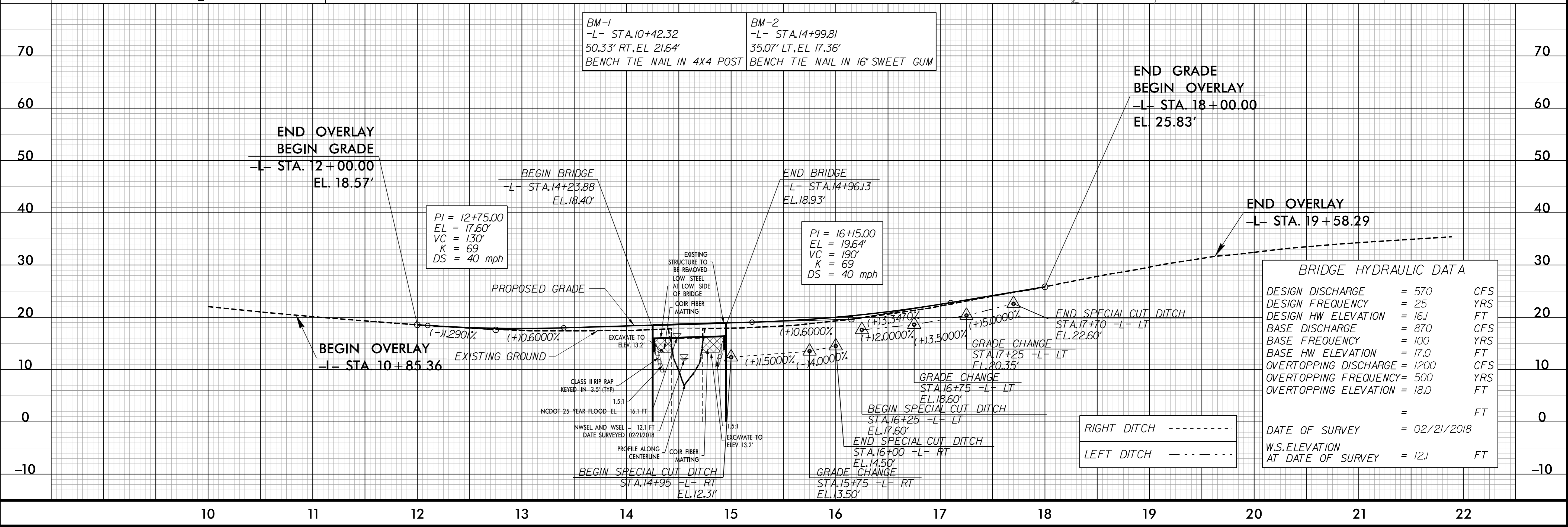
-L-
 PI Sta 17+39.49
 $\Delta = 10^\circ 51' 44.7" (RT)$
 $D = 2^\circ 43' 42.1"$
 $L = 398.13'$
 $T = 199.66'$
 $R = 2,100.00'$
 $e = 0.05$
 $RO = 110.00'$
 $DS = 50\text{mph}$



* NOTE: CONTRACTOR RESPONSIBLE FOR REPAIR OF DAMAGED SEWER LINES.

Scale: 50' 25' 0' 50' 100'

PLANS



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 570	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 16J	FT
BASE DISCHARGE	= 870	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 17.0	FT
OVERTOPPING DISCHARGE	= 1200	CFS
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING ELEVATION	= 18.0	FT
	=	FT
DATE OF SURVEY	= 02/21/2018	
W.S. ELEVATION AT DATE OF SURVEY	= 12J	FT

REVISIONS

-SYSTEM BEE40_r-dw-psh_04.dgn

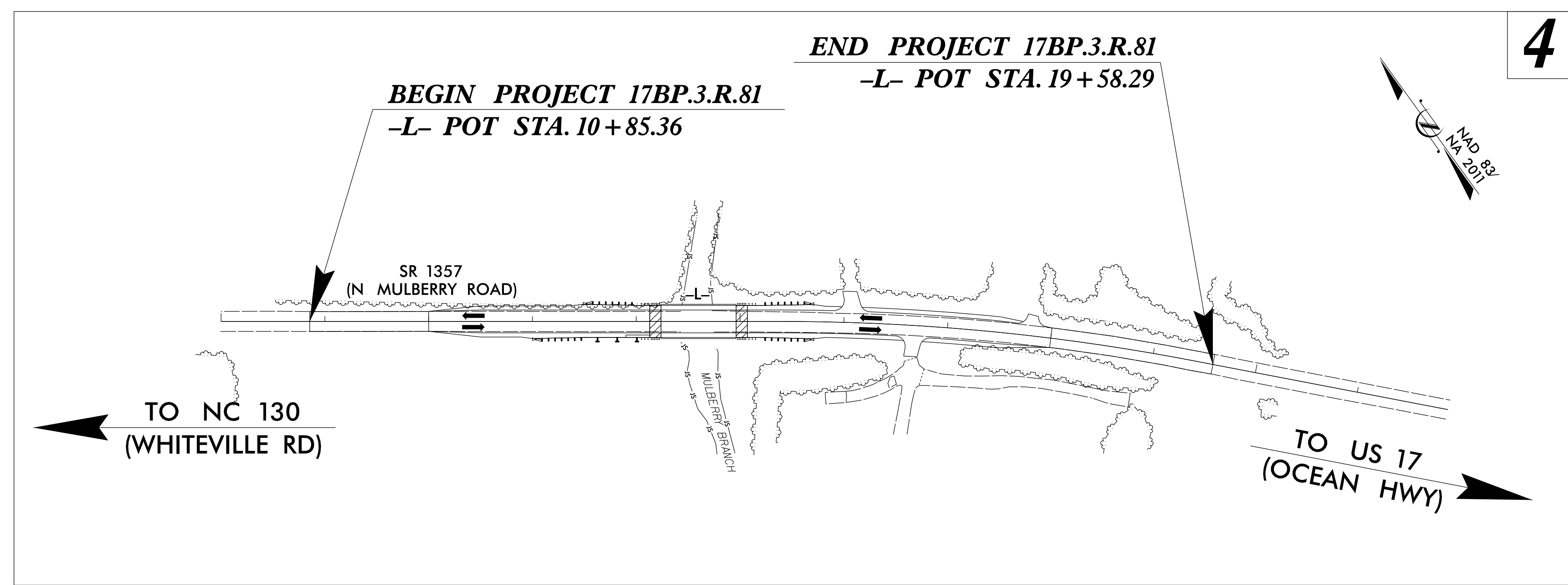
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N.C.	17BP.3.R.81	RW01	5

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

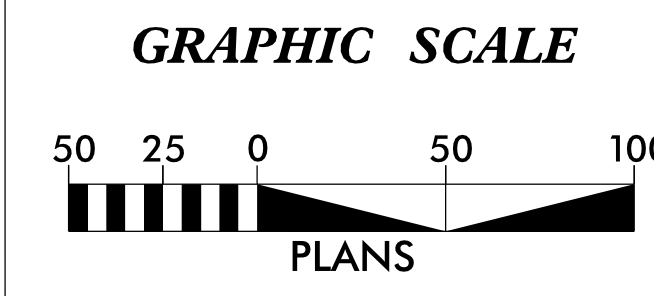
SURVEY CONTROL, EXISTING CENTERLINES,
RIGHT OF WAY, EASEMENTS AND PROPERTY TIES

BRUNSWICK COUNTY

TIP PROJECT: 17BP.3.R.81



4



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "B5540-2" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 88670.653(ft) EASTING: 2182022.830(ft) ELEVATION: 33.335(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.0001159519

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B5540-2" TO -L- STATION 10+00.00 IS S 52°12'14.06" E 560.444(ft)

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:

**LOCATION AND SURVEY'S UNIT
DIVISION 3
5310 BARBADOS BLVD, SUITE 102
CASTLE HAYNE, NORTH CAROLINA 28429**

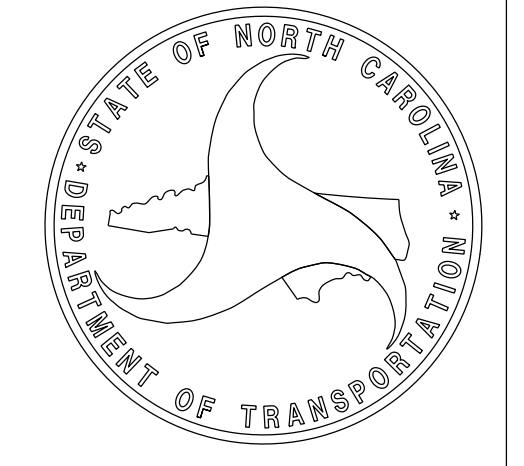
2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: AUGUST 27, 2021	LETTING DATE: MAY 26, 2022
--	--------------------------------------

PROFESSIONAL LAND SURVEYOR


DocuSigned by:
Christopher Sawyer 03/21/2022

SIGNATURE: _____ Date: _____



SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO. 17BP.3.R.81	SHEET NO. RW02C-1
Location and Surveys	
LOCATION AND SURVEY'S UNIT DIVISION 3 5310 BARBADOS BLVD., SUITE 102 CASTLE HAYN, N.C. 28429	
PROJECT SURVEYOR 	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

BL	POINT	DESC.	NORTH	EAST	ELEVATION	BL STATION	OFFSET
	B55401	GPS CAP & REBAR	89254.3320	2181354.0450	48.03	5+00.00	0.00
	B55402	GPS CAP & REBAR	88670.6530	2182022.8300	33.34	13+87.67	0.00
	BL101	TRV CAP & REBAR	88270.8121	2182510.8400	20.40	20+18.56	0.00
	BL102	TRV CAP & REBAR	87974.0764	2182977.9350	19.40	25+71.94	0.00
	BL103	TRV CAP & REBAR	87664.8660	2183302.3220	33.63	30+20.09	0.00

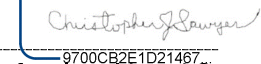
EL	POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT		88327.183	2182465.691							
LINE				S 54°06'10.6" E	539.82					
PC		88010.667	2182902.988							
CURVE				S 48°40'18.2" E	397.53	10°51'44.7*(RT)	02°43'42.1"	398.13	199.66	2100.00
PT		87748.147	2183201.511							
LINE				S 43°14'25.8" E	250.96					
POT		87565.329	2183373.432							

I, CHRISTOPHER J. SAWYER, PLS, certify that the Project Control was verified under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: **AA**
 Type of GPS field procedure: RTN
 Dates of survey: October 2017
 Datum/Epoch: NAVD 88
 Published/Fixed-control use: NAD 83 NA 2011
 Localized around: "B5540-2"
 Northing: 88670.653
 Easting: 2182022.830
 Combined grid factor: 1.0001159519
 Geoid model: 12A
 Units: US Survey Feet

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed October 2017, and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 13th day of December, 2021.

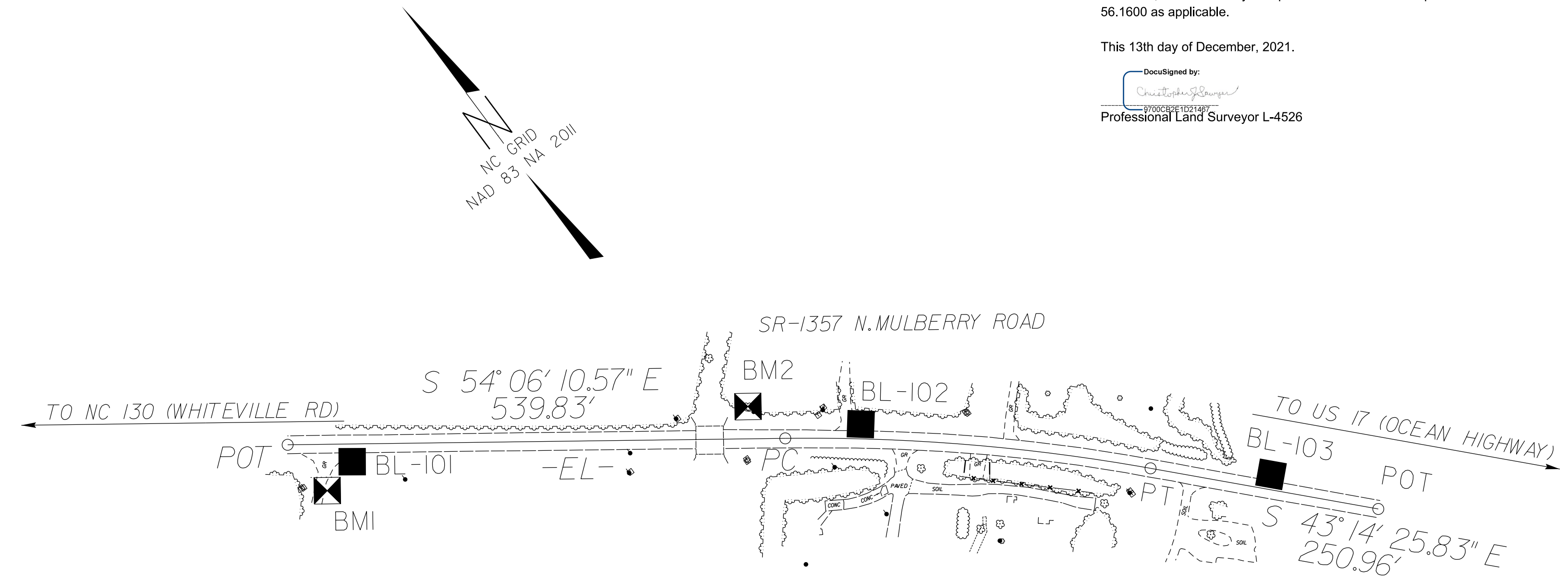
DocuSigned by:

 Christopher J. Sawyer
 Professional Land Surveyor L-4526

REVISIONS

I3-DEC-2021 15:39 S:\Units\2021\Projects\Bridges\Bridges\B5540\0202\Work\King\150 series ROW sheets\17bp.3.r.81.ls_r_w02c-1_211207.dgn m_jduval At LS-258896

B5540-1

B5540-2



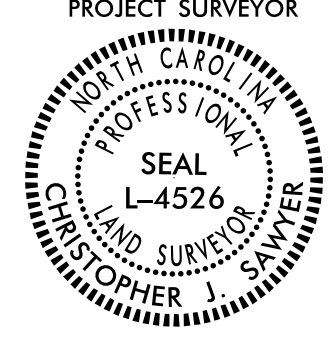
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*****
BM1      ELEVATION = 21.64
N 88262      E 2182470
BL STATION 19+93.71 33 RIGHT
BENCH TIE NAIL IN 4X4 WD POST
*****
BM2      ELEVATION = 17.36
N 88063      E 2182891
BL STATION 24+51.24 28 LEFT
BENCH TIE NAIL IN 16" SWEET GUM
*****
    
```

NOTES:

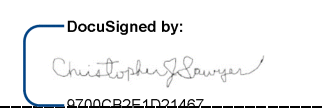
1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO. 17BP.3.R.81	SHEET NO. RW02D-1
Location and Surveys	
LOCATION AND SURVEY'S UNIT DIVISION 3 5310 BARBADOS BLVD, SUITE 102 CASTLE HAYNE, NORTH CAROLINA 28429	
PROJECT SURVEYOR 	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

I, Christopher J. Sawyer, PLS, certify that the data compiled and provided to me by NCDOT and do not certify to the accuracy or quality of the individual data sources.

This 13th day of December, 2021.


Professional Land Surveyor L-4526

TYPE	STATION	NORTH	EAST
POT	10+00.00	88327.1830	2182465.6912
PC	15+39.82	88010.6669	2182902.9881
PT	19+37.95	87748.1473	2183201.5108
POT	21+88.91	87565.3289	2183373.4320

NOTES:

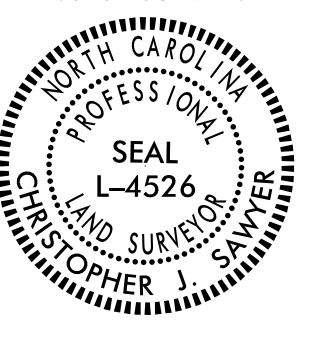
1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE PROPOSED ALIGNMENT CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

REVISIONS

REVISIONS

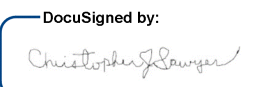
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RIGHT OF WAY AND PERMANENT EASEMENT CONTROL SHEET

PROJECT REFERENCE NO. 17BP.3.R.81	SHEET NO. RW03E-1REV
Location and Surveys	
LOCATION AND SURVEY'S UNIT DIVISION 3 5310 BARBADOS BLVD., SUITE 102 CASTLE HAYNE, N.C. 28429	
PROJECT SURVEYOR 	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

I, Christopher J. Sawyer, certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from ___ to November 4, 2021, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 17th day of February, 2022.

DocSigned by:

 Christopher J. Sawyer
 Professional Land Surveyor L-4526

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	17+85.00	-30.00	87877.4035	2183113.4389
L	17+85.00	-49.00	87891.3893	2183126.2995
L	17+85.00	-58.00	87898.0142	2183132.3914

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED NOVEMBER 4, 2021.

Location and Surveys

LOCATION AND SURVEY'S UNIT
DIVISION 3
5310 BARBADOS BLVD, SUITE 102
CASTLE HAYNE, NORTH CAROLINA 28429



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

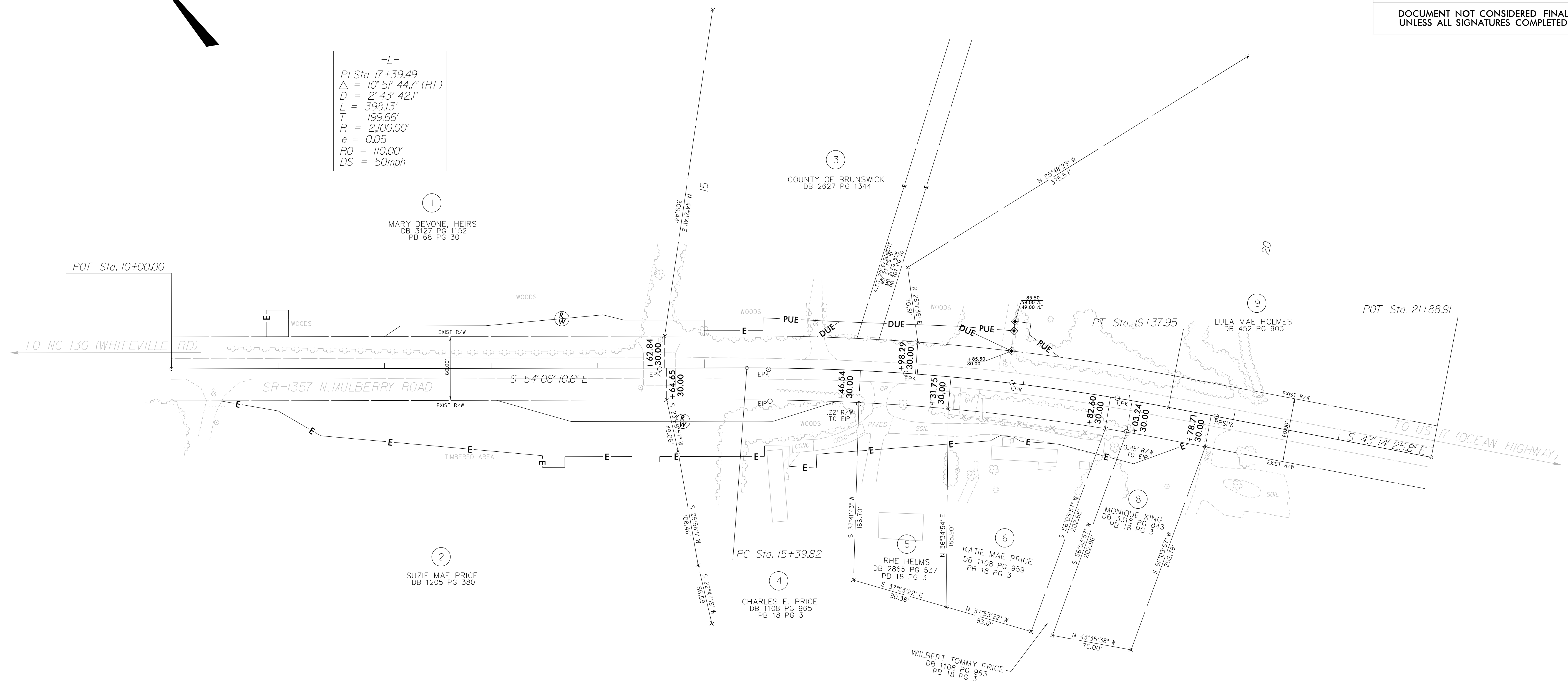
I, Christopher J. Sawyer, certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed November 4, 2021, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 21st day of February, 2022.

DocuSigned by:
Christopher Sawyer
Professional Land Surveyor L-4526

NC GRID
NAD 83 NA 2011

-L-
PI Sta 17+39.49
$\Delta = 10^{\circ} 51' 44.7''$ (RT)
D = 2' 43' 42.1"
L = 398.13'
T = 199.66'
R = 2,100.00'
e = 0.05
RO = 110.00'
DS = 50mph



REVISIONS

REVISIONS

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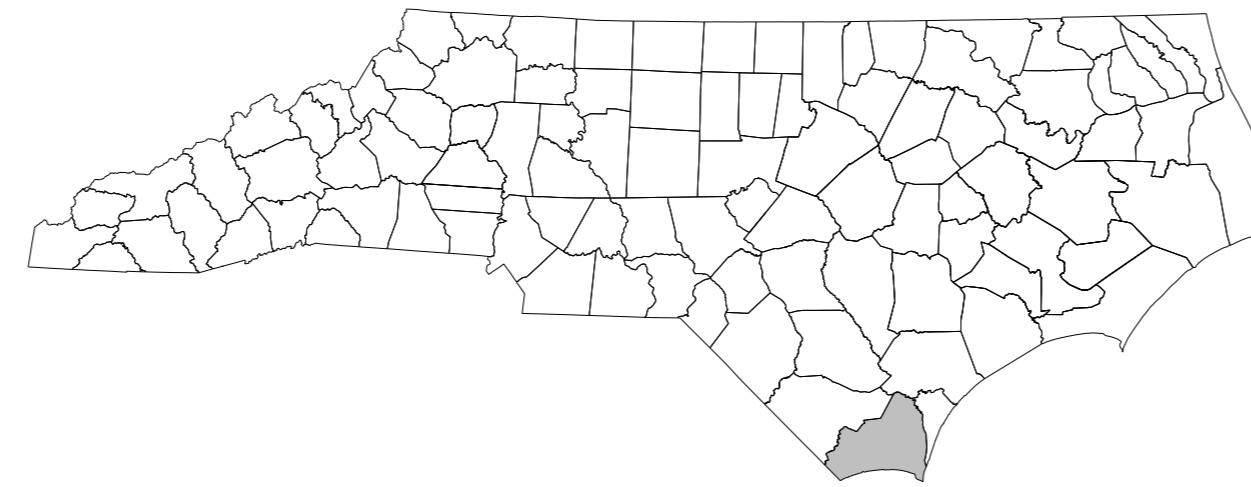
NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

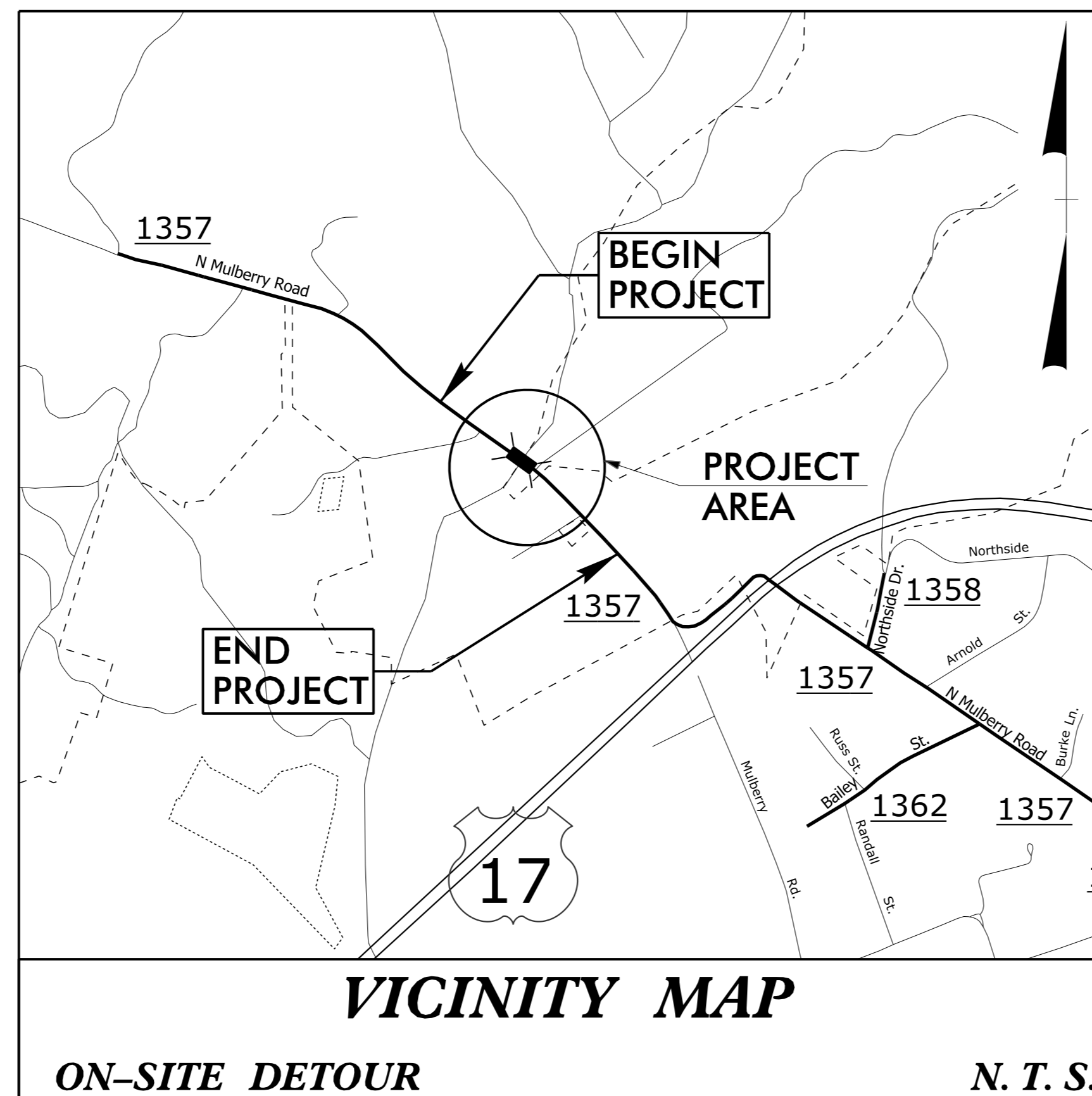
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

BRUNSWICK COUNTY



**LOCATION: REPLACE BRIDGE 202 OVER MULBERRY BRANCH
ON SR 1357 (N MULBERRY ROAD)**



INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND LEGEND
TMP-1B	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES, GENERAL NOTES, AND PHASING)
TMP-2	ON-SITE DETOUR DETAIL 1 (PHASE I)
TMP-3	ON-SITE DETOUR DETAIL 2 (PHASE II)

SHEET NO.

TMP-1

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UNLESS ALL SIGNATURES COMPLETED**

APPROVED: Adam M. Conrad

DATE: 3/10/2022

CDM Smith
CDM Smith Inc.
5400 Glenwood Avenue
Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

SEAL



PLANS PREPARED BY:

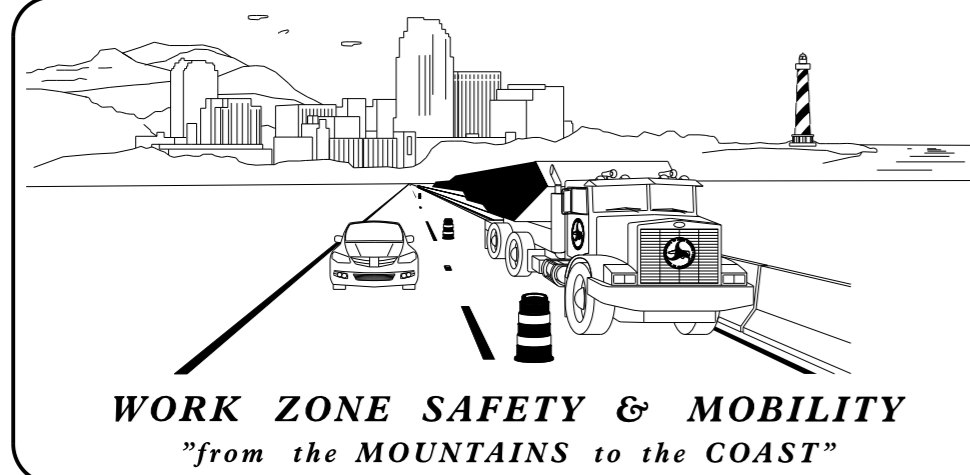
ADAM CONRAD, P.E.
PROJECT ENGINEER

TRUNG NGUYEN, P.E.
PROJECT DESIGN ENGINEER

NCDOT CONTACTS:

KEN THORNEWELL, P.E.
PROJECT ENGINEER

MIKE STEELMAN
PROJECT DESIGN ENGINEER



12/22/2021
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User: DEMJYCKR

PROJECT: 17BP.3.R.81

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGERS
1180.01	SKINNY - DRUMS
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO LANE AND MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - (PERMANENT AND TEMPORARY)
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- TEMP. SHORING (LOCATION PURPOSES ONLY)

- WORK AREA
- WEDGE AND/OR WIDEN (USING FLAGGERS)

SIGNALS

- EXISTING
- PORTABLE

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM SKINNY DRUM TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW BOARD
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED ATTENUATOR (TMA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

TEMPORARY PAVEMENT MARKING

SYMBOL	DESCRIPTION	PAY ITEM
	WHITE EDGELINE	PAINT (4")
	WHITE STOP BAR	PAINT (24")
	YELLOW DOUBLE CENTER	THERMO (4", 90 MIL)

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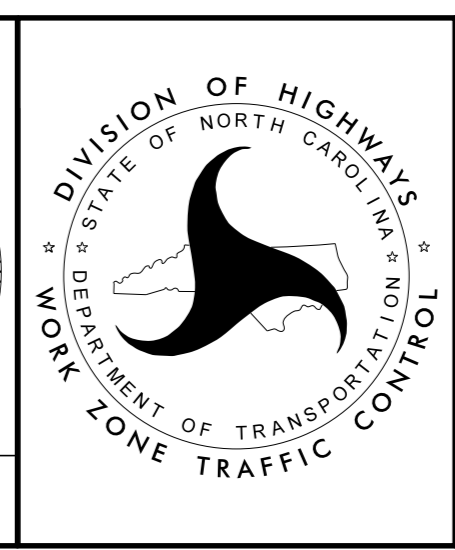


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APPROVED: *Aden M. Conrad*
DATE: 3/10/2022

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ROADWAY STANDARD DRAWINGS & LEGEND

MANAGEMENT STRATEGIES

MAINTENANCE OF TRAFFIC FOR THIS PROJECT HAS BEEN DIVIDED INTO THREE PHASES USING TEMPORARY SIGNALS AND ONE-LANE TWO-WAY TRAFFIC PATTERNS.

DURING PHASE I, CONSTRUCT TEMPORARY ROADWAY AND BRIDGE AWAY FROM TRAFFIC. USING FLAGGERS CONSTRUCT A SMOOTH TIE FROM EXISTING TO PROPOSED DETOUR. SHIFT TRAFFIC TO TEMPORARY PATTERN.

DURING PHASE II, TRAFFIC WILL BE MAINTAINED IN A ONE-LANE TWO-WAY PATTERN ON THE ON-SITE DETOUR WITH THE USE OF TEMPORARY SIGNALS WHILE THE PROPOSED BRIDGE AND ROADWAY IS CONSTRUCTED.

DURING PHASE III, REMOVE DETOUR BRIDGE AND ABANDONED PAVEMENT. USING FLAGGERS COMPLETE PROJECT AND PLACE FINAL LAYER OF SURFACE COURSE, FINAL PAVEMENT MARKINGS & MARKERS AND PLACE TRAFFIC IN FINAL PATTERN.

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

LANE AND SHOULDER CLOSURE REQUIREMENTS

- A) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.
- B) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.
- C) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO A DIVIDED FACILITY AND WITHIN 10 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.
- D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.
- E) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

PAVEMENT EDGE DROP OFF REQUIREMENTS

- F) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:

BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.

BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

PAVEMENT EDGE DROP OFF REQUIREMENTS

- G) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

- H) NOTIFY THE ENGINEER THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

- I) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
- J) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.
- K) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 200 FT IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC CONTROL DEVICES

- L) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.
- M) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

PAVEMENT MARKINGS AND MARKERS

- N) INSTALL TEMPORARY PAVEMENT MARKINGS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

ROAD NAME	MARKING	MARKER
SR 1357 -L_DET-	PAINT	N/A
- O) PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.
- P) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- Q) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

PHASING

NOTES: COMPLETE ANY PROPOSED WIDENING IN SUCH A MANNER THAT PONDING OF WATER WILL NOT OCCUR IN THE TRAVEL LANE. THIS MAY REQUIRE A COMBINATION OF INSTALLATION OF PROPOSED PIPES, TEMPORARY PIPES, STEEL PLATES, AND TEMPORARY DITCHES.

ALL REFERENCES TO CONSTRUCTION INCLUDE PAVING UP TO BUT NOT INCLUDING FINAL LAYER OF SURFACE COURSE UNLESS SPECIFICALLY CALLED FOR.

COORDINATE WITH PROPERTY OWNERS TO MAINTAIN DRIVEWAY ACCESS FOR THE DURATION OF CONSTRUCTION.

PHASE I:

- STEP 1: INSTALL ADVANCE WORK ZONE WARNING SIGNS ACCORDING TO ROADWAY STANDARD DRAWING (RSD) 1101.01 (SHEET 3 OF 3).
- STEP 2: AWAY FROM TRAFFIC, CONSTRUCT DETOUR BRIDGE AND ROADWAY FROM STA 12+20+/- -L_DET- TO STA 18+00+/- -L_DET- (SEE SHEET TMP-2).
- STEP 3: USING RSD 1101.02 (SHEET 1 OF 14) AND FLAGGERS, CONSTRUCT DETOUR TIE-INS FROM STA 10+85+/- -L_DET- TO STA 12+20+/- -L_DET- AND FROM STA 18+00+/- -L_DET- TO STA 19+57+/- -L_DET- (SEE SHEET TMP-2).

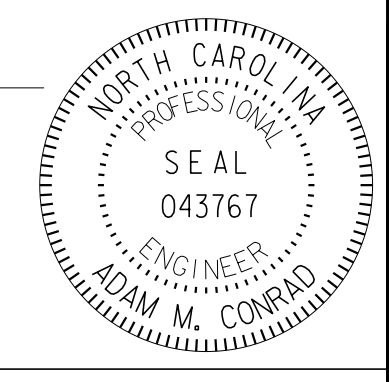
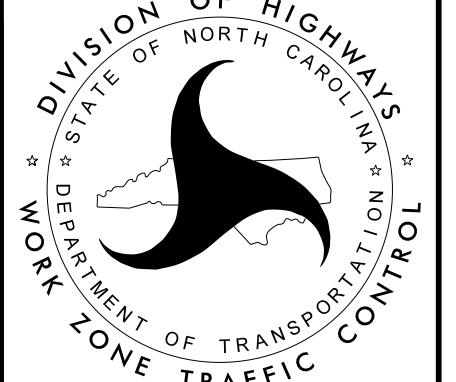
PHASE II:

- STEP 1: INSTALL PROPOSED TEMPORARY PAVEMENT MARKINGS AND SIGNS ACCORDING TO SHEET TMP-3 AND SHIFT TRAFFIC TO ONE-LANE TWO-WAY TRAFFIC PATTERN.
- STEP 2: AWAY FROM TRAFFIC, REMOVE EXISTING BRIDGE (REFER TO STRUCTURE PLANS) AND CONSTRUCT -L- FROM STA 12+80+/- -L- TO STA 15+95+/- -L- (INCLUDING THE PROPOSED BRIDGE). PLACE FINAL LAYER OF SURFACE COURSE. PLACE FINAL PAVEMENT MARKINGS/MARKERS IN FINAL PATTERN.
- STEP 3: USING FLAGGERS, CONSTRUCT WIDENING/WEDGING ON -L- FROM STA 15+95+/- -L- TO STA 17+25+/- -L-. PLACE FINAL LAYER OF SURFACE COURSE. PLACE FINAL PAVEMENT MARKINGS/MARKERS IN FINAL PATTERN.

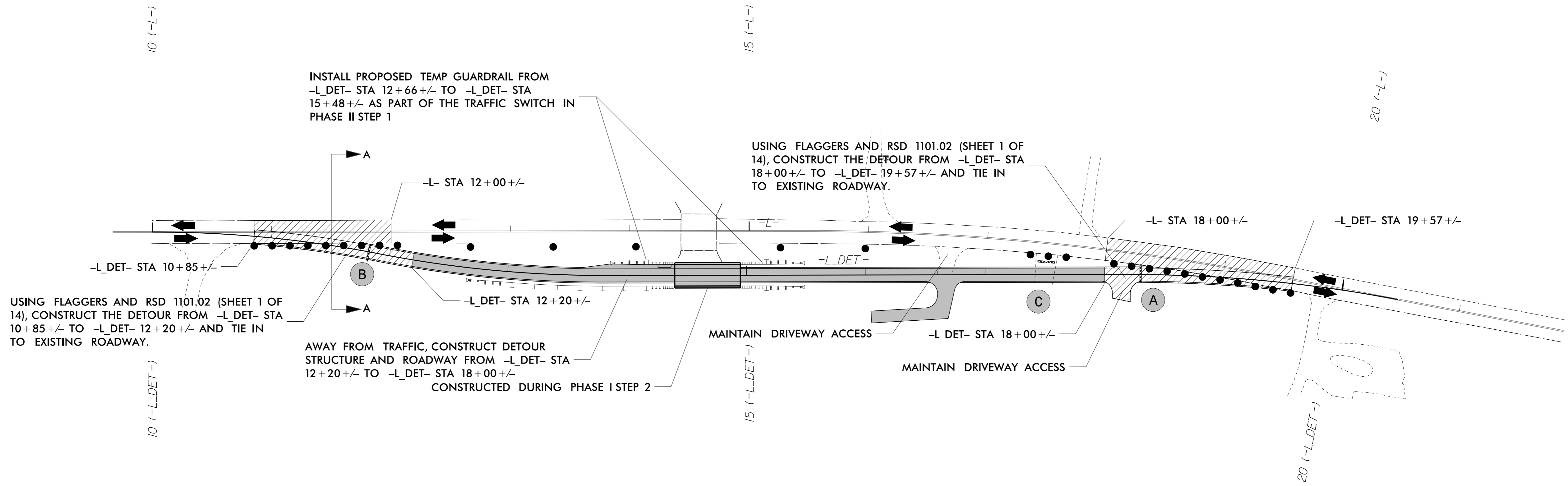
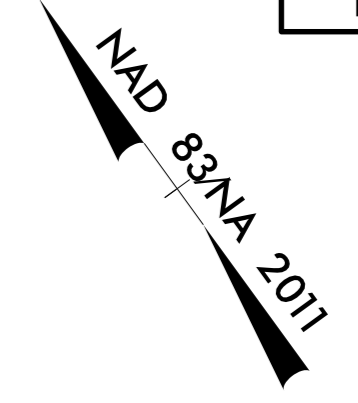
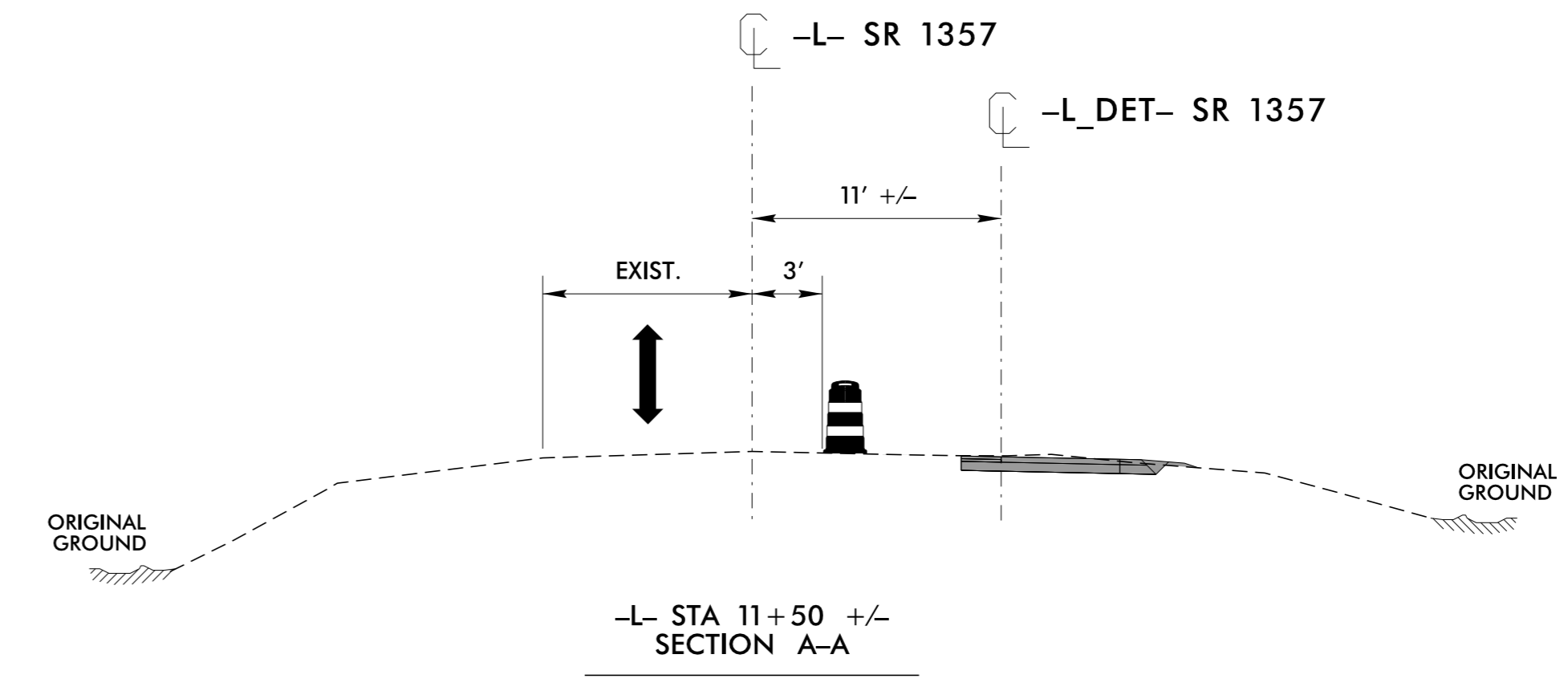
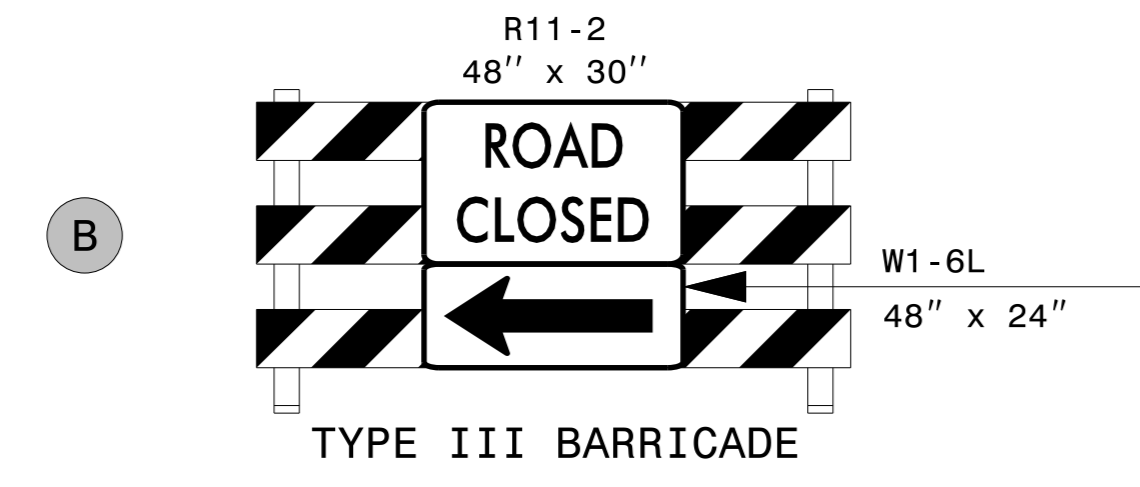
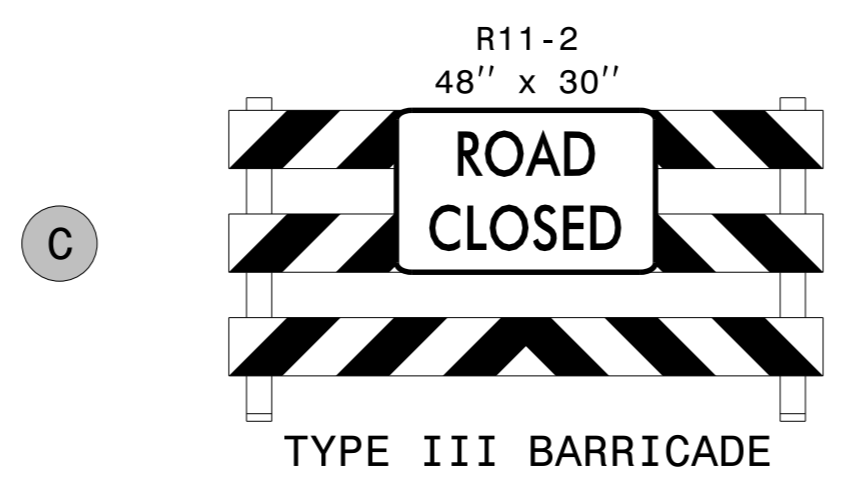
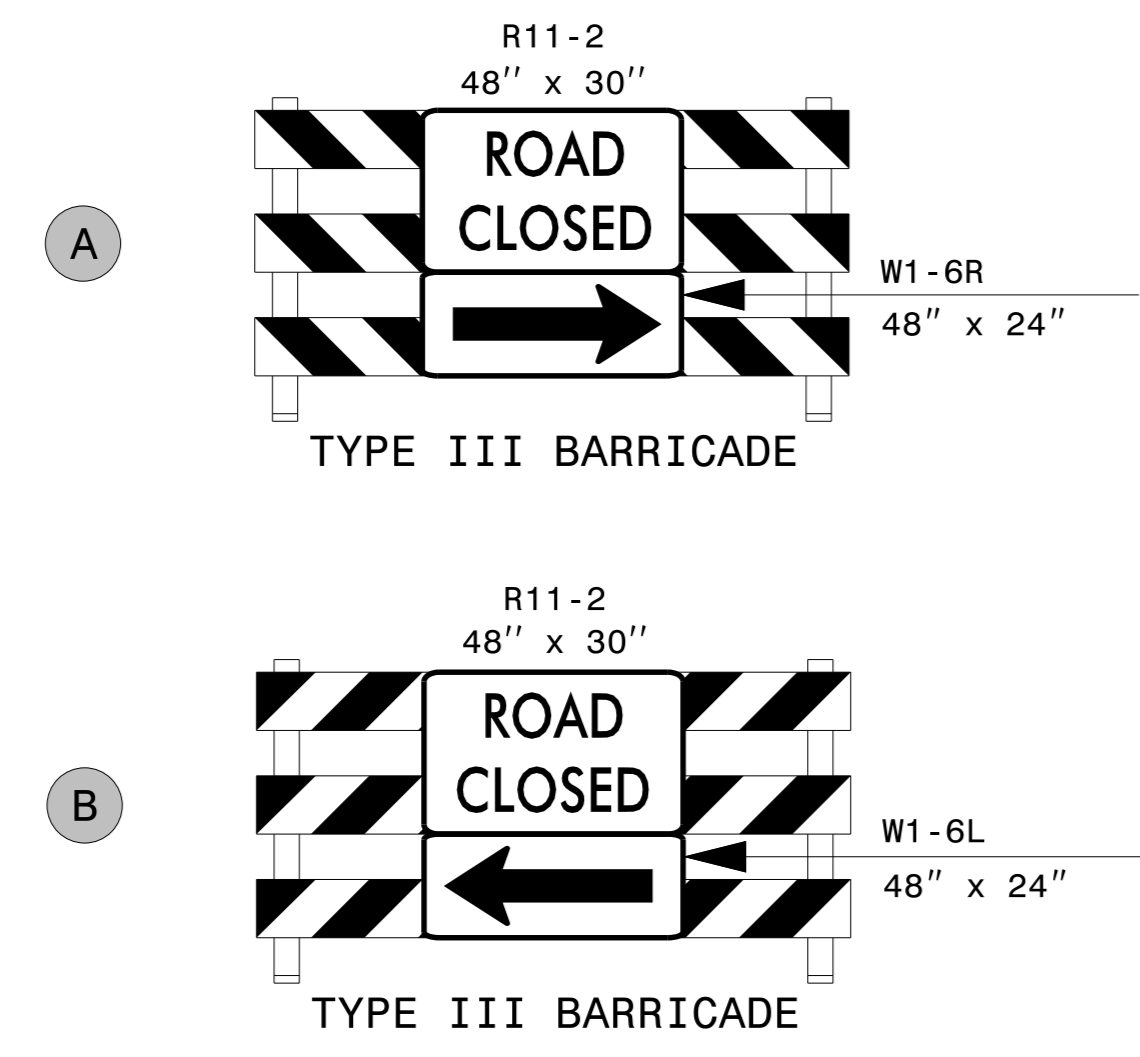
PHASE III (NOT SHOWN)

- STEP 1: SHIFT DETOUR TRAFFIC BACK TO -L- IN FINAL TRAFFIC CONFIGURATION. USING RSD 1101.02 (SHEET 1 OF 14) AND FLAGGERS, CONSTRUCT WIDENING/WEDGING/RESURFACING ON -L- FROM STA 10+85+/- TO STA 12+80+/- AND -L- FROM STA 17+25+/- TO STA 19+57+/- . PLACE FINAL LAYER OF SURFACE COURSE. PLACE FINAL PAVEMENT MARKINGS/MARKERS IN FINAL PATTERN.
- STEP 2: AWAY FROM TRAFFIC, REMOVE DETOUR ROADWAY AND BRIDGE. CONSTRUCT PROPOSED DRIVEWAY TIES DISTURBED BY THE DETOUR REMOVAL.

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APPROVED: <i>Adam M. Conrad</i> <small>00DC0FFA0F09A4D...</small> DATE: 3/10/2022 SEAL 		<h2 style="margin: 0;">TRANSPORTATION OPERATIONS PLAN</h2>
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

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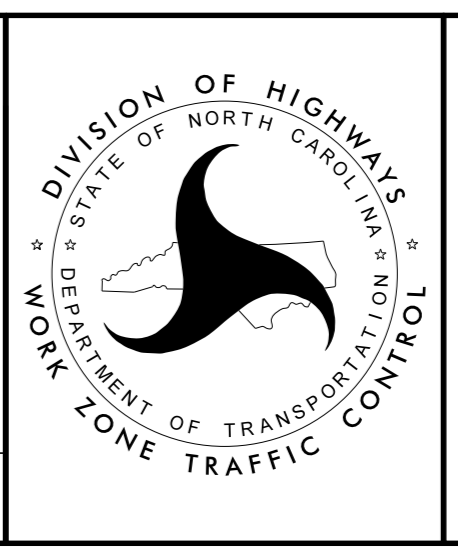
CDM Smith
 CDM Smith Inc.
 5400 Glenwood Avenue
 Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255

APPROVED: *Aden M. Conrad*
 DATE: 3/10/2022

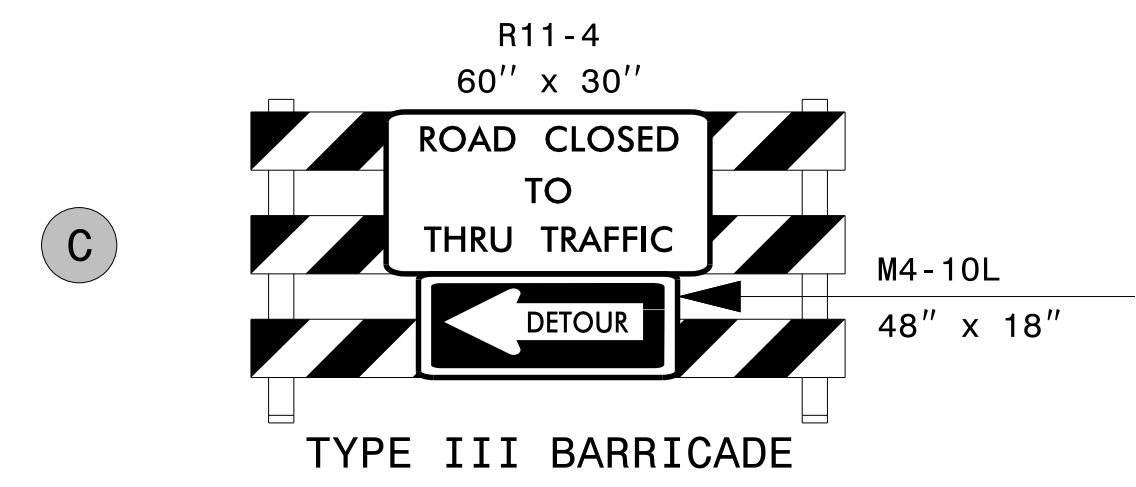
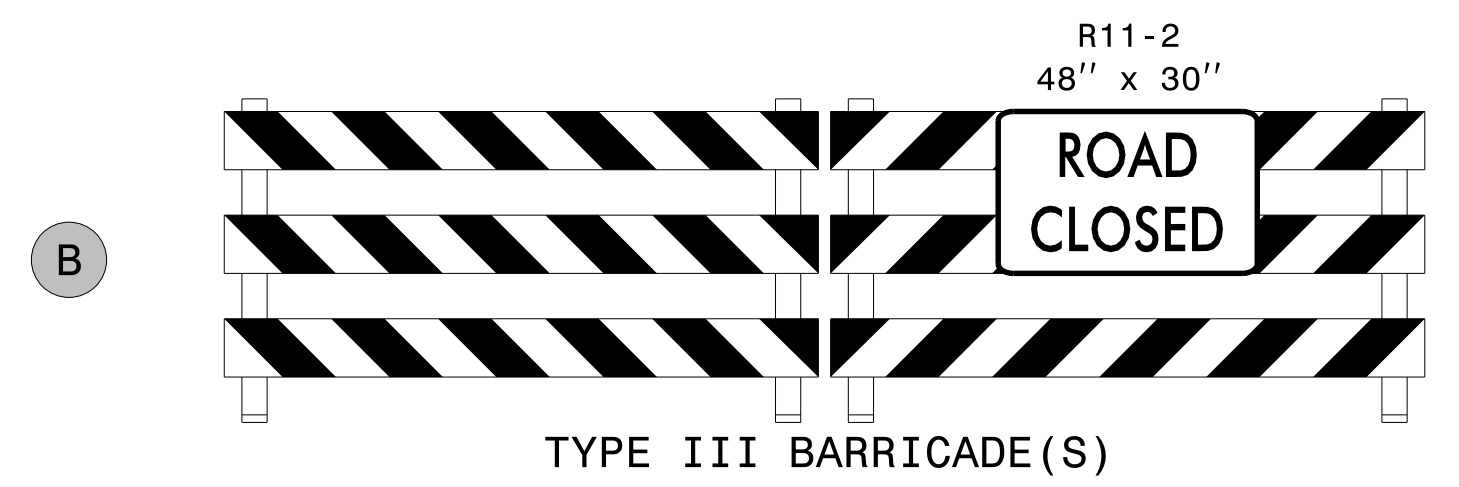
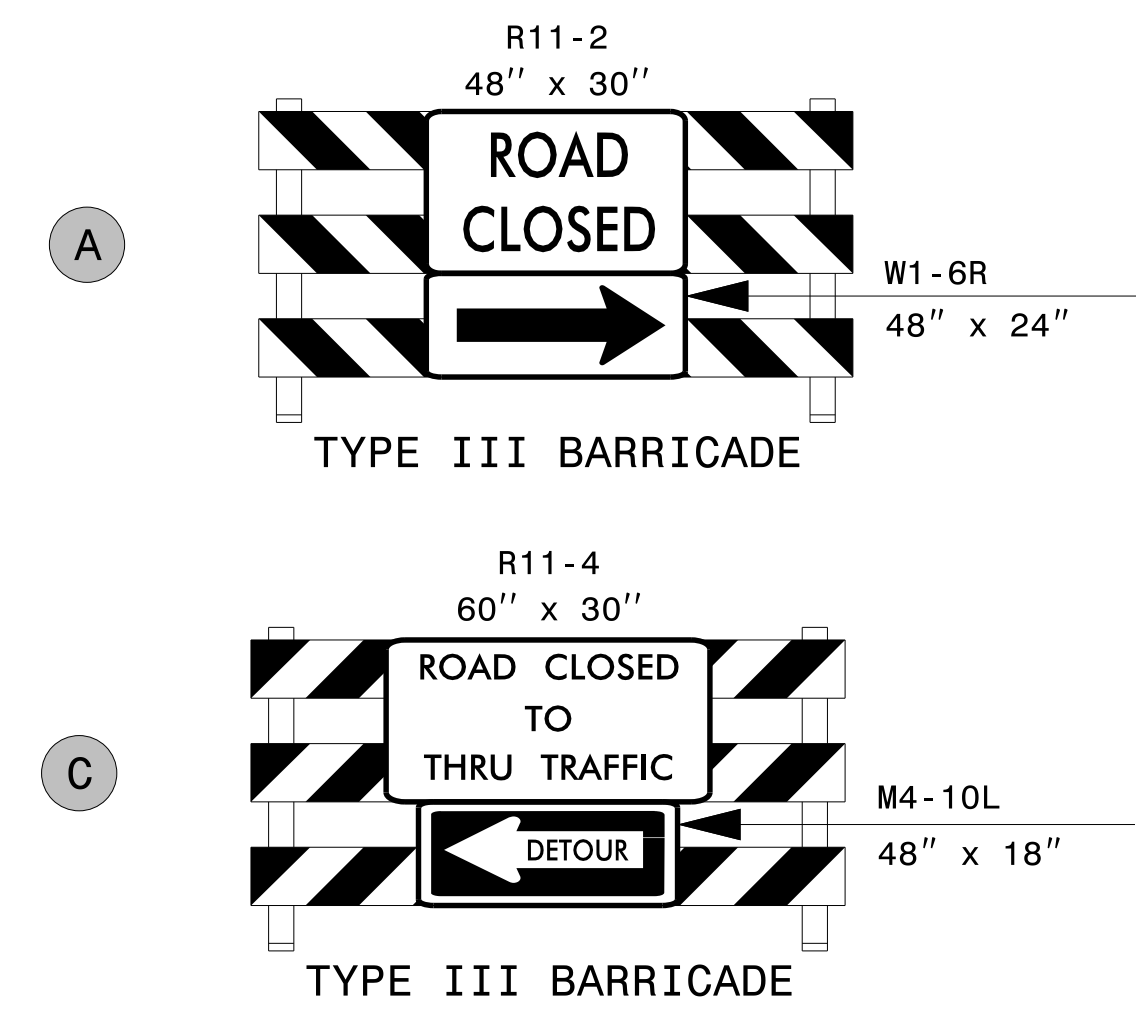
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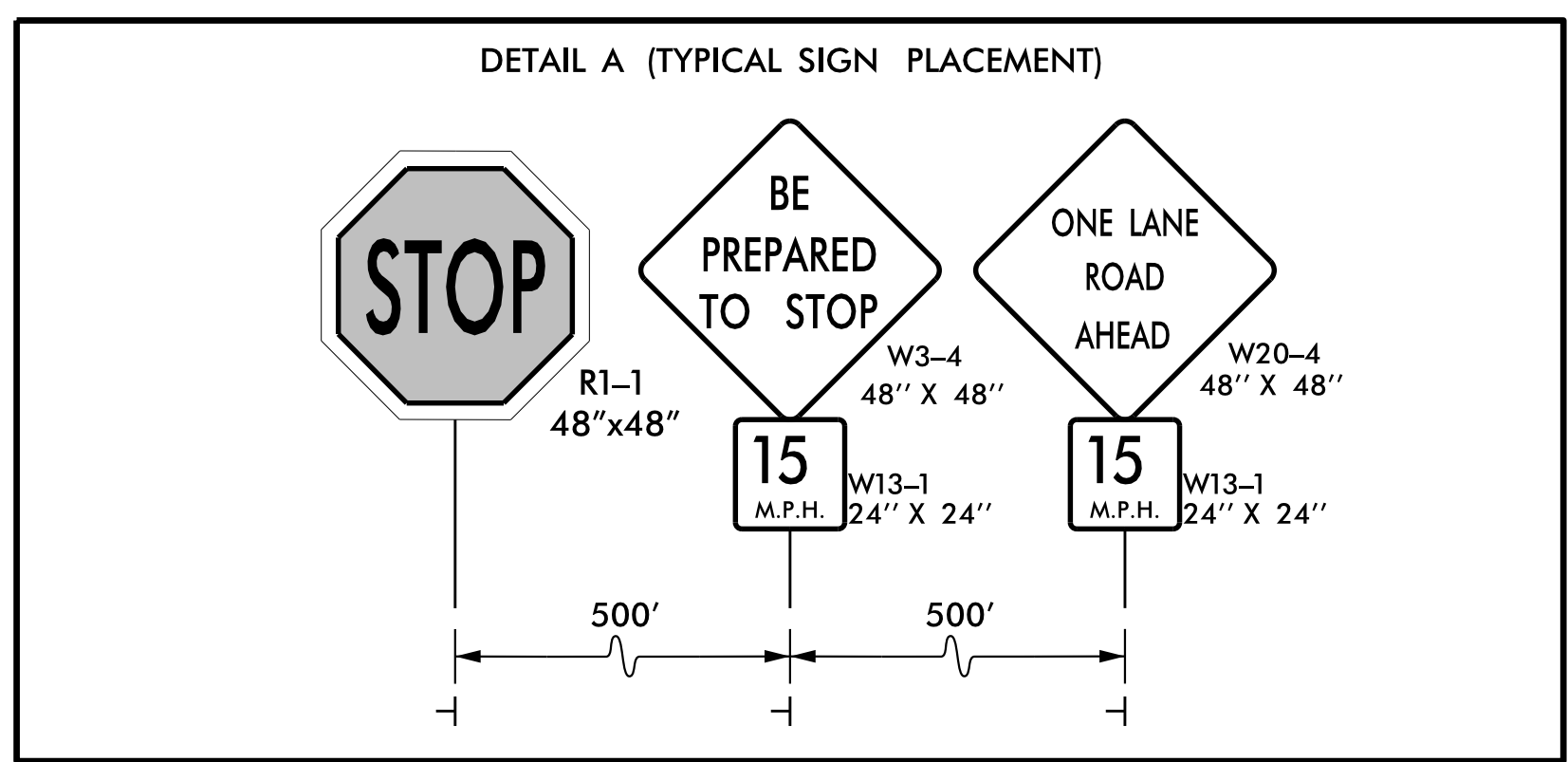
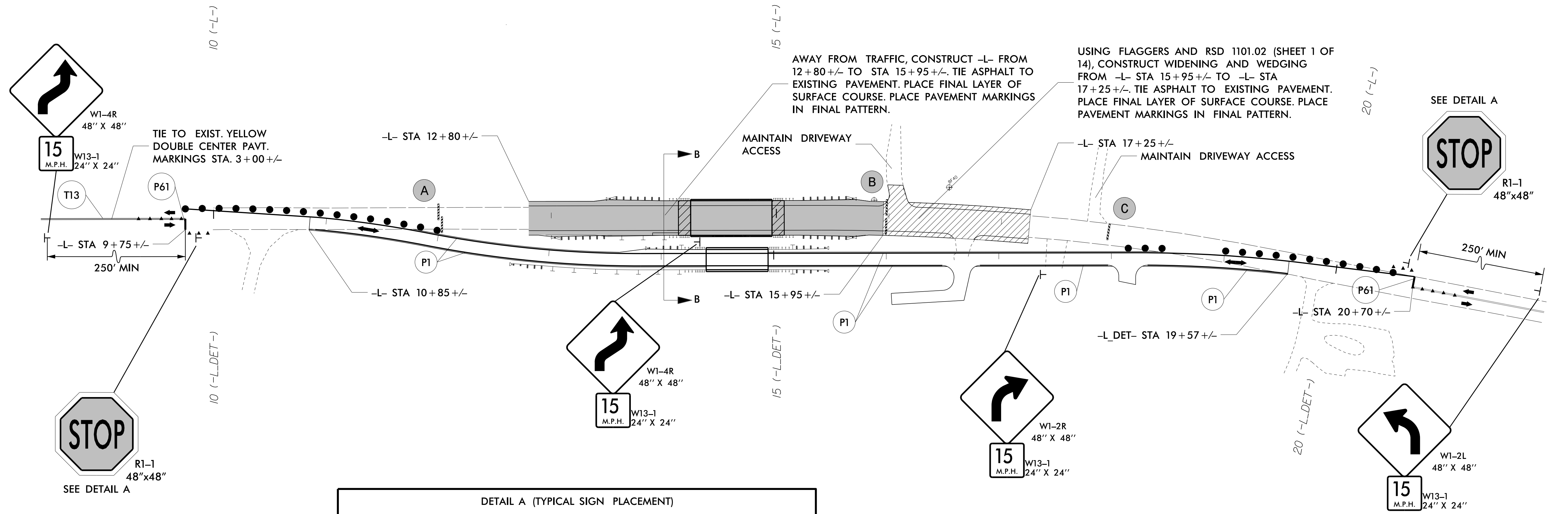
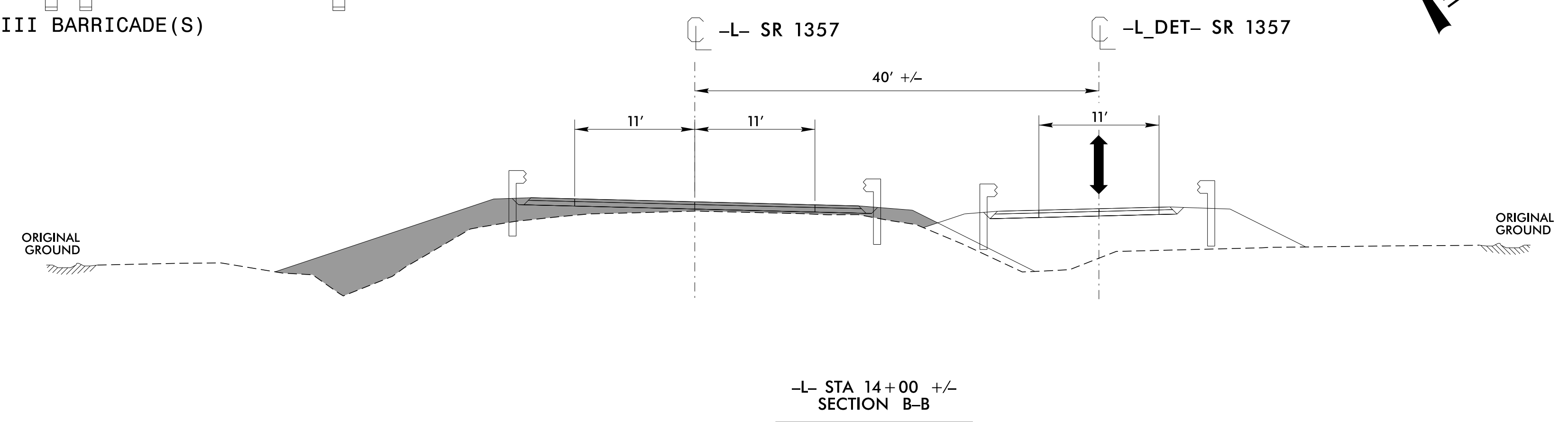
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ON-SITE DETOUR
 DETAIL 1
 (PHASE I)



NOTE: REMOVE CONFLICTING PAVEMENT MARKINGS AT VEHICLE CROSSOVERS



APPROVED: *Adam M. Conrad*

DATE: 3/10/2022

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SEAL

ADAM M. CONRAD

043767

ENGINEER

NORTH CAROLINA

PROFESSIONAL

ON-SITE DETOUR
DETAIL 2
(PHASE II)

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NC COA No. F-1255

2/1/2022
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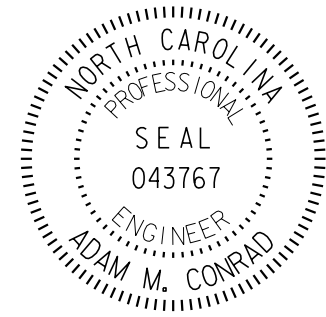
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PROJECT: 17BP.3.R.81

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN BRUNSWICK COUNTY

**LOCATION: REPLACE BRIDGE 202 OVER MULBERRY BRANCH
ON SR 1357 (N. MULBERRY ROAD)**

TIP NO. 17BP.3.R.81	SHEET NO. PMP - 1
Approved by: <u>Adam M. Conrad</u> <small>0000FFAF0904AD</small>	
DATE: 3/10/2022	
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

GENERAL NOTES

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN, OR DIRECTED BY THE ENGINEER.

A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
SR 1357 (N. MULBERRY ROAD)	THERMOPLASTIC	PERMANENT RAISED


B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

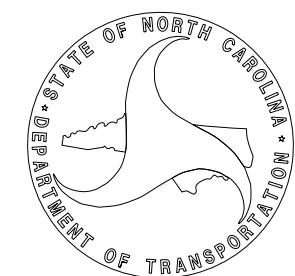
C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.

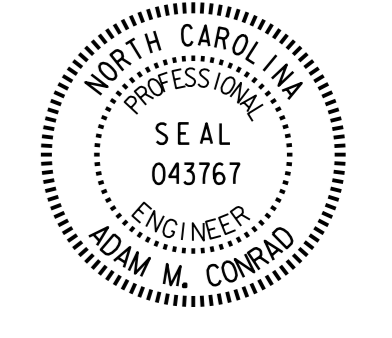
D) PASSING ZONES WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

INDEX

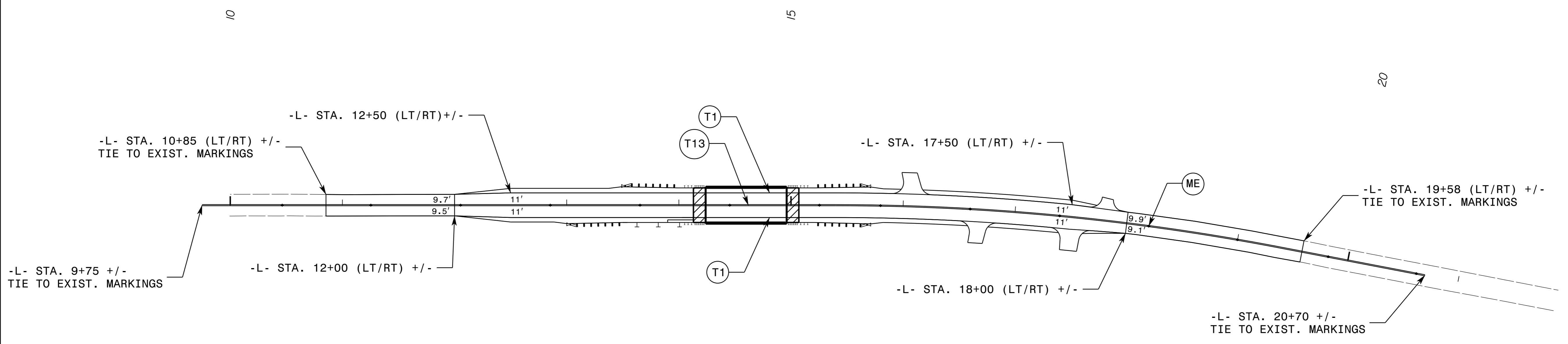
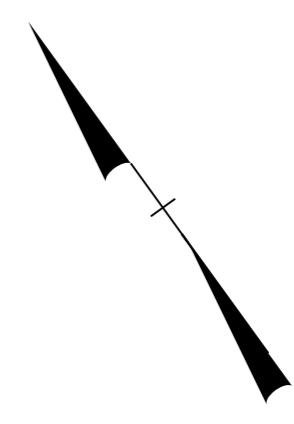
SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN TITLE SHEET
PMP-2	PAVEMENT MARKING DETAIL

PLAN PREPARED BY: CDM SMITH, INC.	
DAVID Z. KEISER, P. E. PROJECT MANAGER	 CDM Smith Inc. 5400 Glenwood Avenue Suite 400 Raleigh, NC 27612-3228 NC COA No. F-1255
ADAM M. CONRAD, P. E. PROJECT DESIGN ENGINEER	

PLAN REVIEWED BY: N.C.D.O.T. DIVISION 3	
JESSI LEONARD, P.E. DIVISION TRAFFIC ENGINEER	
ANTHONY W. LAW DIVISION CONSTRUCTION ENGINEER	

TIP NO. 17BP.3.R.81	SHEET NO. PMP-2
APPROVED: <i>Adam M. Conrad</i> 3/10/2022	
DATE: 3/10/2022	
SEAL 	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
CDM Smith CDM Smith Inc. 5400 Glenwood Avenue Suite 400 Raleigh, NC 27612-3228 NC COA No. F-1255	

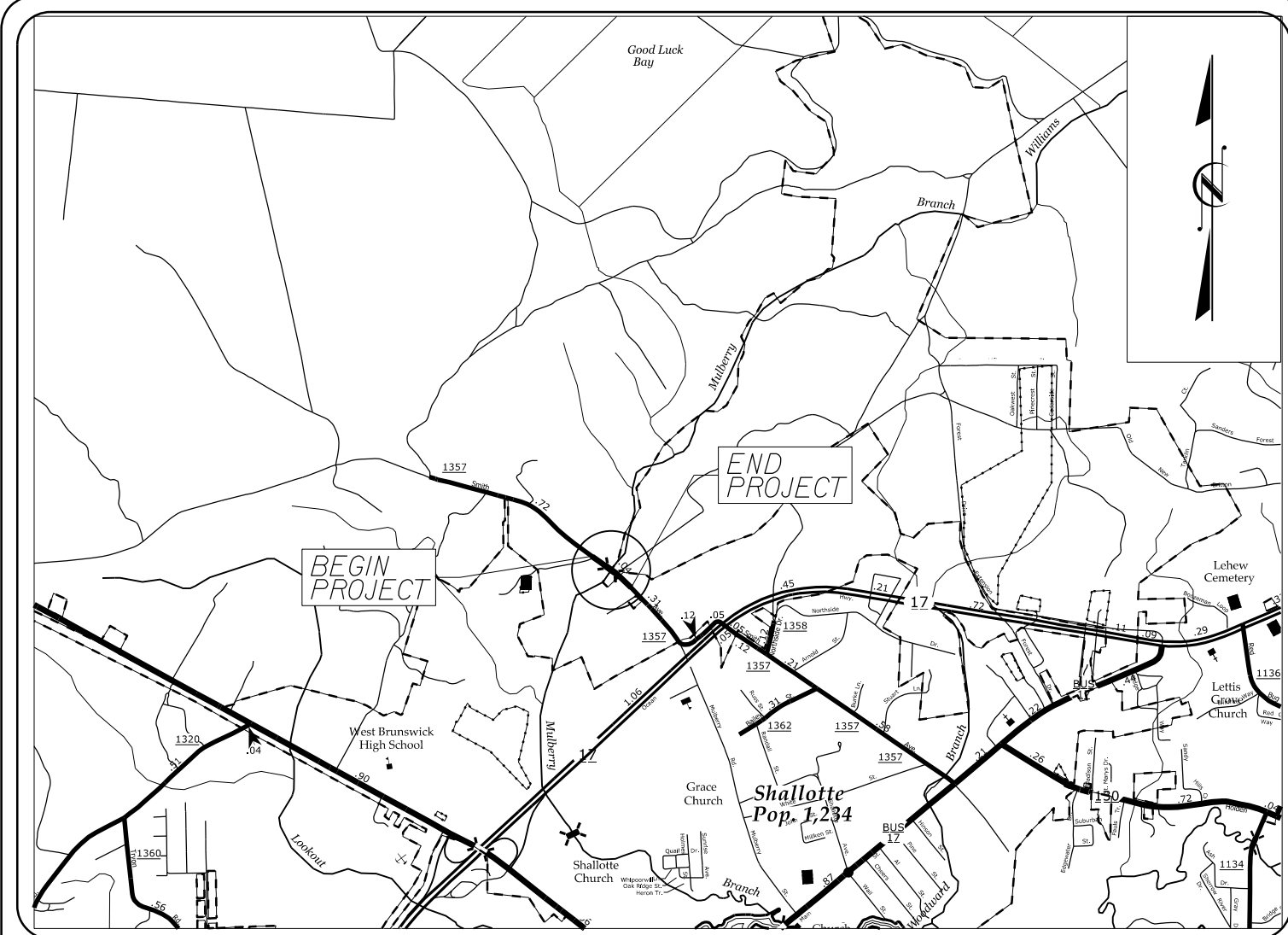
PAVEMENT MARKING SCHEDULE	
SYMBOL	DESCRIPTION
	THERMO (4", 90 MILS)
T1	WHITE EDGELINE
T13	YELLOW DOUBLE CENTER
	PERMANENT RAISED PAVEMENT MARKERS
ME	YELLOW & YELLOW



DATE PLOTTED: 3/10/2022 10:58 AM

PAVEMENT MARKING DETAIL

PROJECT: 17BP.3.R.81

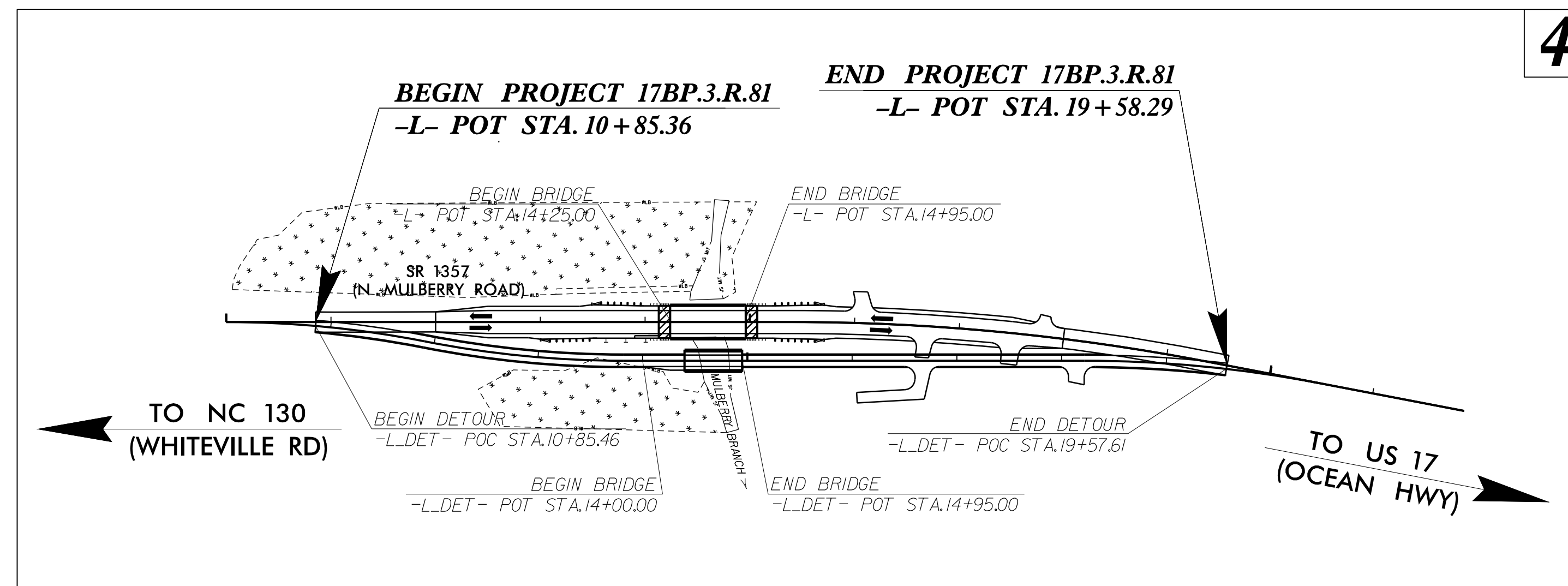


VICINITY MAP
NOT TO SCALE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL
BRUNSWICK COUNTY

**LOCATION: REPLACE BRIDGE 202 OVER MULBERRY BRANCH
ON SR 1357 (N MULBERRY ROAD)**

TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE



4



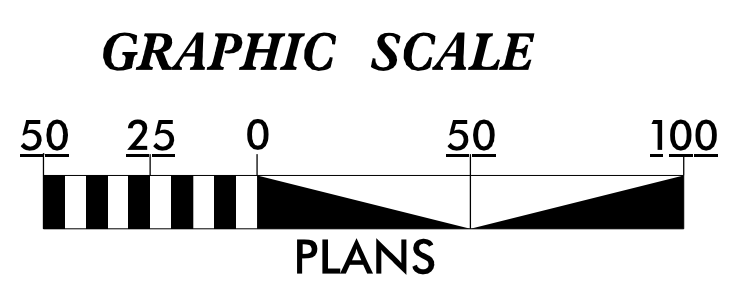
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.3.R.81	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

EROSION AND SEDIMENT CONTROL MEASURES

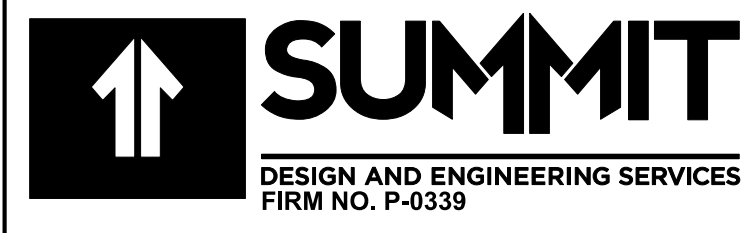
Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	▲▲▲
1622.01	Temporary Berms and Slope Drains	▲
1630.02	Silt Basin Type B	▨
1633.01	Temporary Rock Silt Check Type-A	▨
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	▨
1633.02	Temporary Rock Silt Check Type-B	▶
	Wattle / Coir Fiber Wattle	☾
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	☾
1634.01	Temporary Rock Sediment Dam Type-A	▨
1634.02	Temporary Rock Sediment Dam Type-B	▨
1635.01	Rock Pipe Inlet Sediment Trap Type-A	⊓
1635.02	Rock Pipe Inlet Sediment Trap Type-B	⊓
1630.04	Stilling Basin	▭
1630.06	Special Stilling Basin	▭
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	▭
	Tiered Skimmer Basin	▭
	Infiltration Basin	▭

**THIS PROJECT CONTAINS
EROSION CONTROL PLANS
FOR CLEARING AND
GRUBBING PHASE OF
CONSTRUCTION.**

**NOTE: THE OUTSIDE BUFFER,
WETLAND, OR WATER BOUNDARY
SHALL BE CLEARLY MARKED BY
HIGHLY VISIBLE FENCING
(ORANGE SAFETY FENCE).**



**THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH
THE APPLICABLE REGULATIONS SET FORTH BY THE NCG-010000
GENERAL CONSTRUCTION PERMIT EFFECTIVE APRIL 1, 2019
AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF
ENVIRONMENTAL QUALITY DIVISION OF WATER RESOURCES.**



Prepared in the Office of:
320 Executive Ct.
Hillsborough, NC 27278-8551
Voice: (919)732-3883
Fax: (919)732-6776
www.summitde.net

Designed by:
JASON PATSKOSKI **4069**
NAME LEVEL III CERTIFICATION NO.

Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2018 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

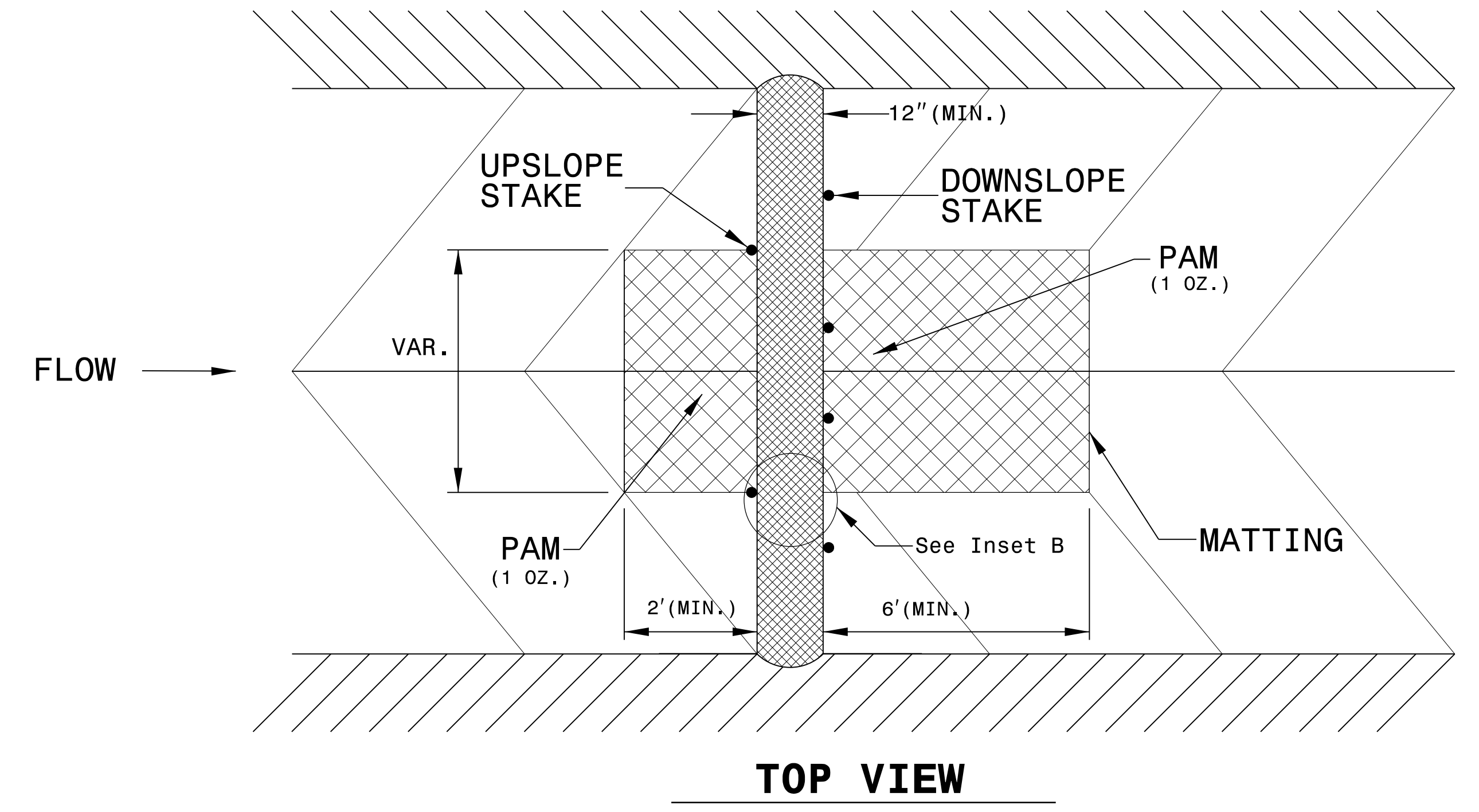
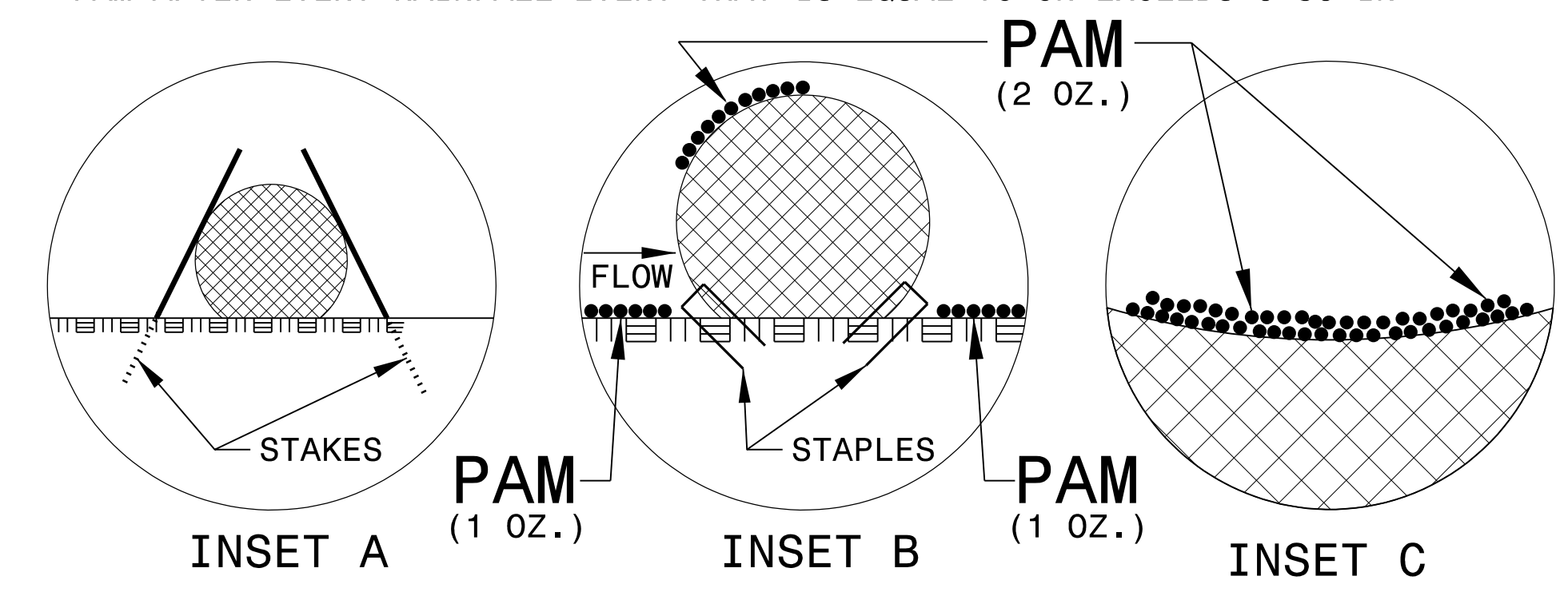
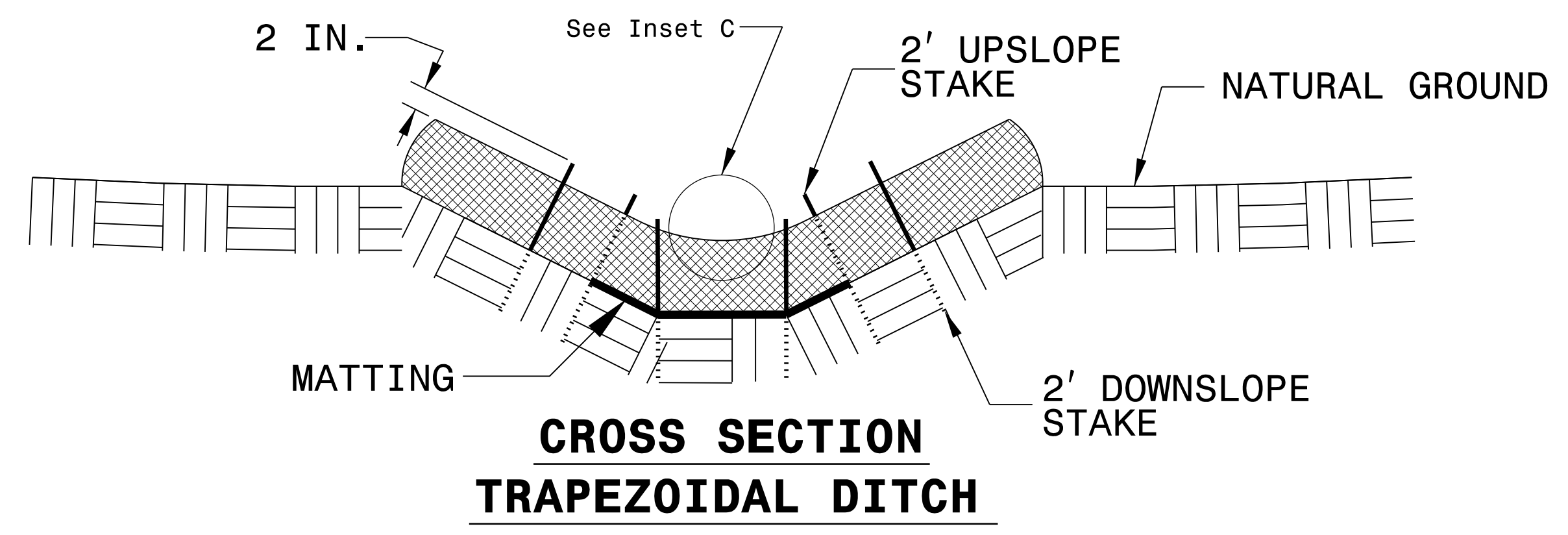
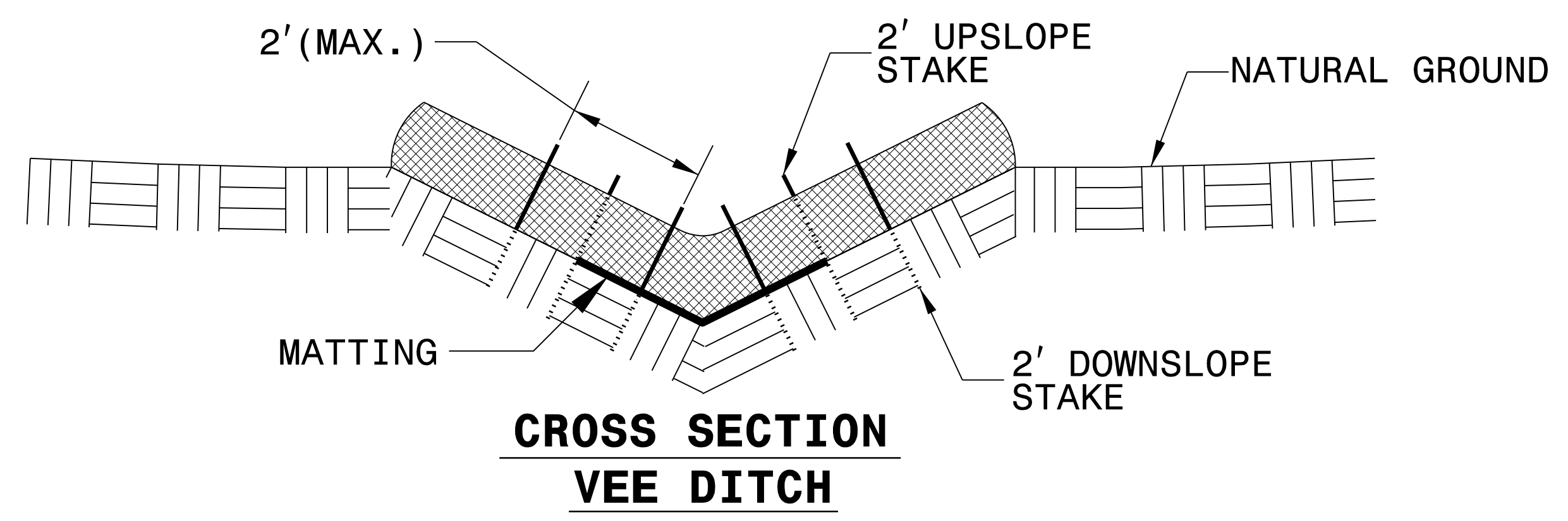
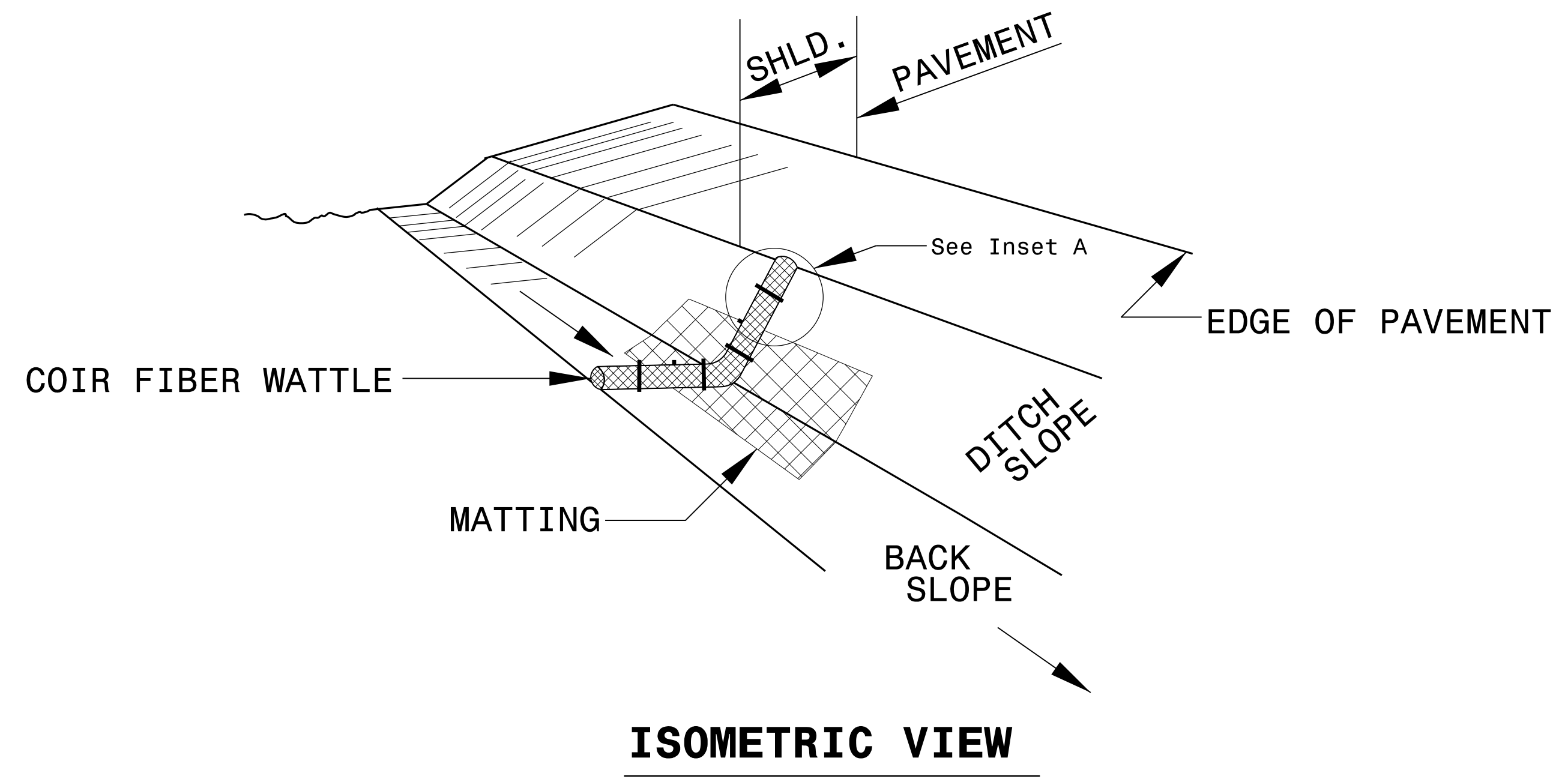
1604.01 Railroad Erosion Control Detail	1632.01 Rock Inlet Sediment Trap Type A
1605.01 Temporary Silt Fence	1632.02 Rock Inlet Sediment Trap Type B
1606.01 Special Sediment Control Fence	1632.03 Rock Inlet Sediment Trap Type C
1607.01 Gravel Construction Entrance	1633.01 Temporary Rock Silt Check Type A
1622.01 Temporary Berms and Slope Drains	1633.02 Temporary Rock Silt Check Type B
1630.01 Riser Basin	1634.01 Temporary Rock Sediment Dam Type A
1630.02 Silt Basin Type B	1634.02 Temporary Rock Sediment Dam Type B
1630.03 Temporary Silt Ditch	1635.01 Rock Pipe Inlet Sediment Trap Type A
1630.04 Stilling Basin	1635.02 Rock Pipe Inlet Sediment Trap Type B
1630.05 Temporary Diversion	1640.01 Coir Fiber Baffle
1630.06 Special Stilling Basin	1645.01 Temporary Stream Crossing
1631.01 Matting Installation	

PROJECT REFERENCE NO. 17BP.3.R.81	SHEET NO. EC-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

COIR FIBER WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL

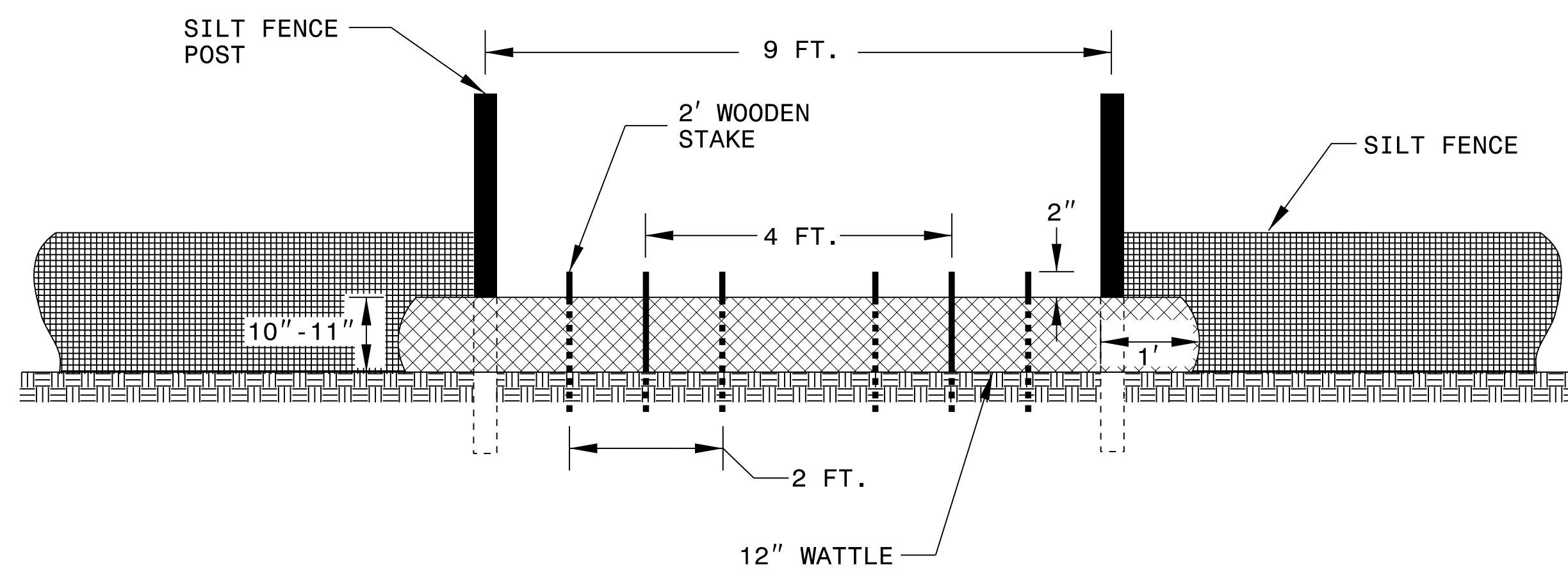
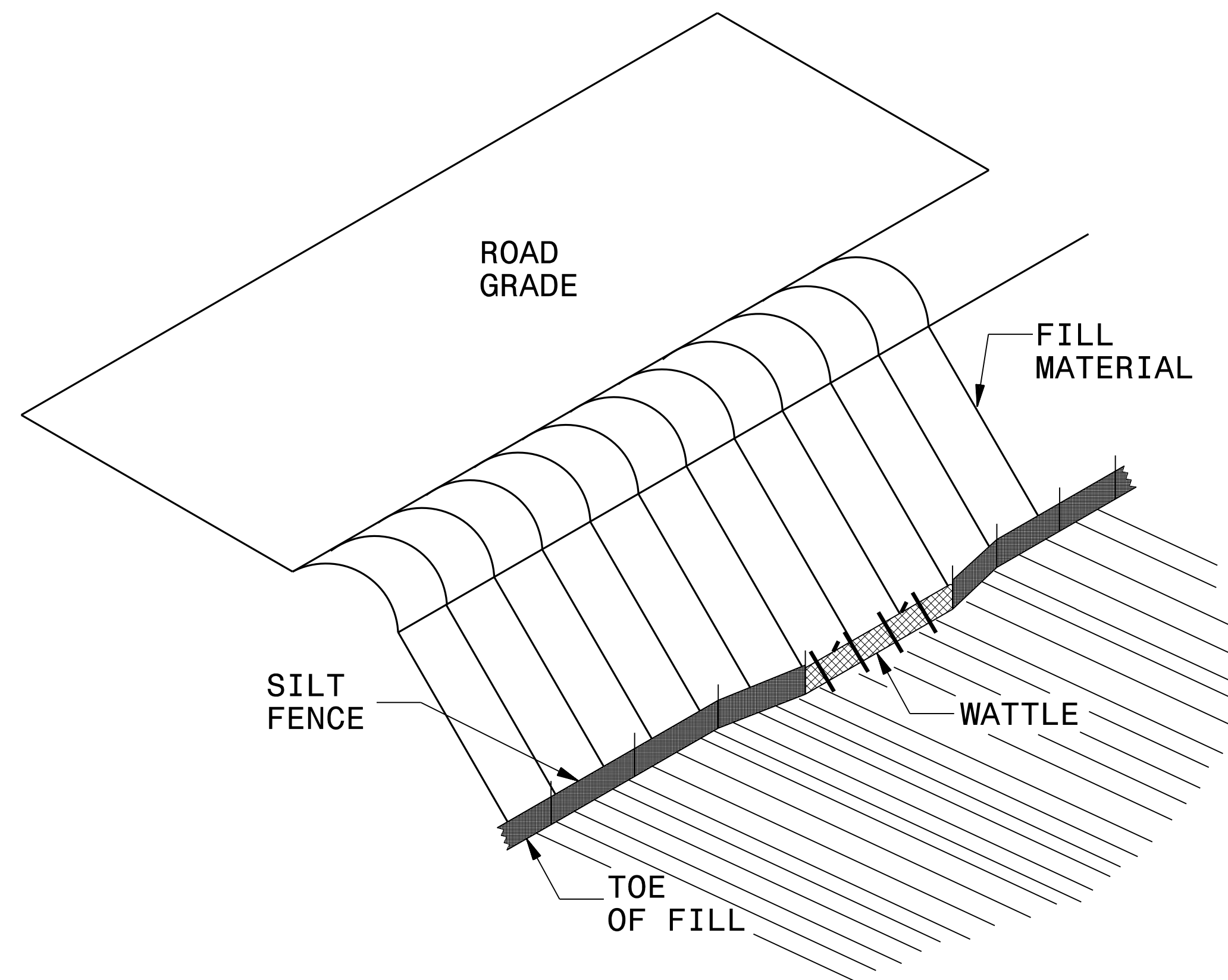
NOTES:

- USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.
- USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.
- ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.
- INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.
- PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.
- INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.
- INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.
- PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.
- INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.



SILT FENCE COIR FIBER WATTLE BREAK DETAIL

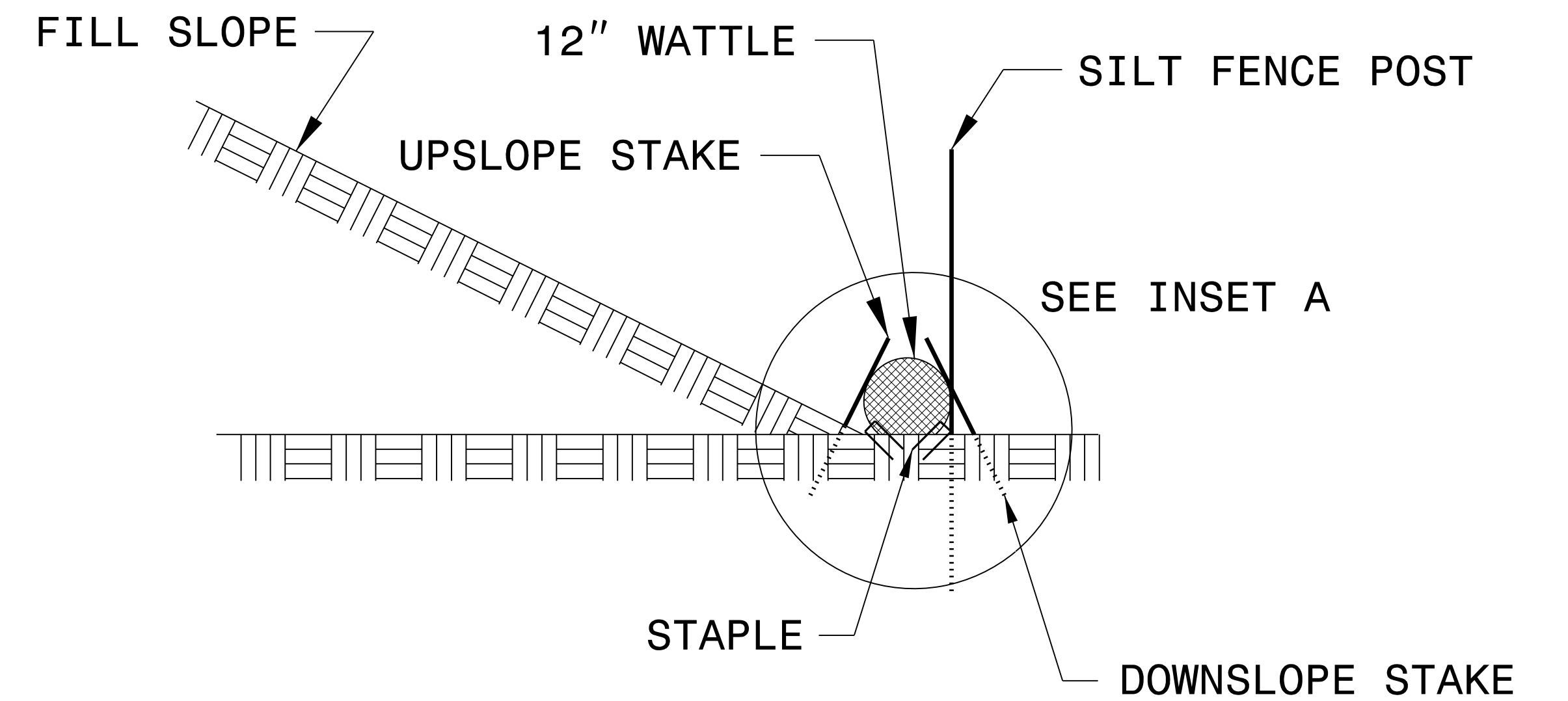
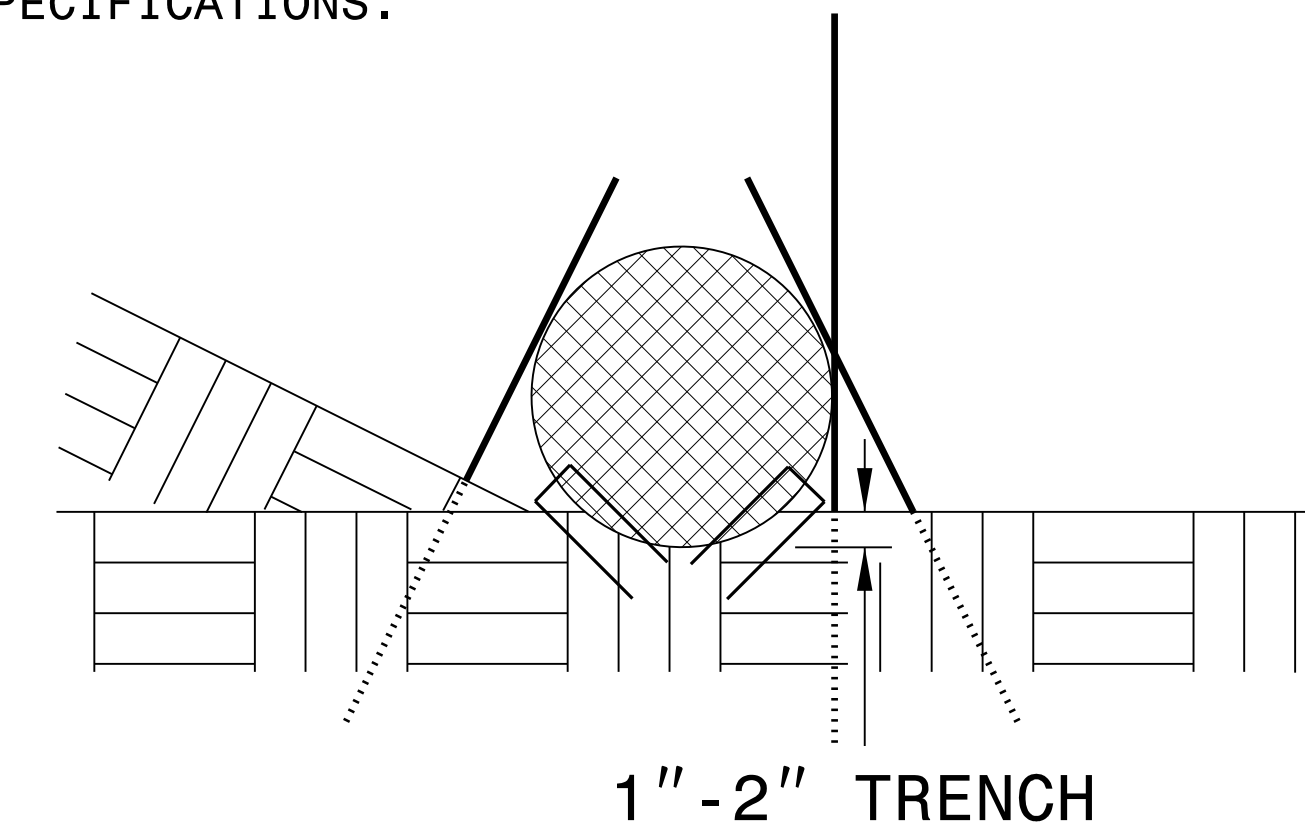
PROJECT REFERENCE NO. 17BP.3.R.81	SHEET NO. EC-2A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



NOTES:

- USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE AND LENGTH OF 10 FT.
- EXCAVATE A 1 TO 2 INCH TRENCH FOR WATTLE TO BE PLACED.
- DO NOT PLACE WATTLE ON TOE OF SLOPE.
- USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.
- INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.
- PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.
- INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.
- WATTLE INSTALLATION CAN BE ON OUTSIDE OF THE SILT FENCE AS DIRECTED.
- INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

INSET A



DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO. <i>17BP.3.R.81</i>	SHEET NO. <i>EC-3</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SOIL STABILIZATION TIMEFRAMES

<i>SITE DESCRIPTION</i>	<i>STABILIZATION TIME</i>	<i>TIMEFRAME EXCEPTIONS</i>
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
17BP.3.R.81	EC-3A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR CUT DITCHES

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
20-1	-LDET-	15+35	17+00	RT	115
20-1	-LDET-	17+00	18+00	RT	70
20-1	-LDET-	18+00	19+00	RT	70
20-1	-LDET-	17+00	17+50	LT	35
			SUBTOTAL		290
	MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER				1520
			TOTAL		1810
			SAY		1850

PERMANENT SOIL REINFORCEMENT MAT

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
20-1	-LDET-	17+50	18+00	LT	35
			SUBTOTAL		35
			ADDITIONAL PSRM TO BE INSTALLED		325*
			TOTAL		360
			SAY		400
	*325 SY OF PSRM TO BE INSTALLED IN DITCHES				
	*SEE DETAIL 4-1 AND 4-2				

8.17.799

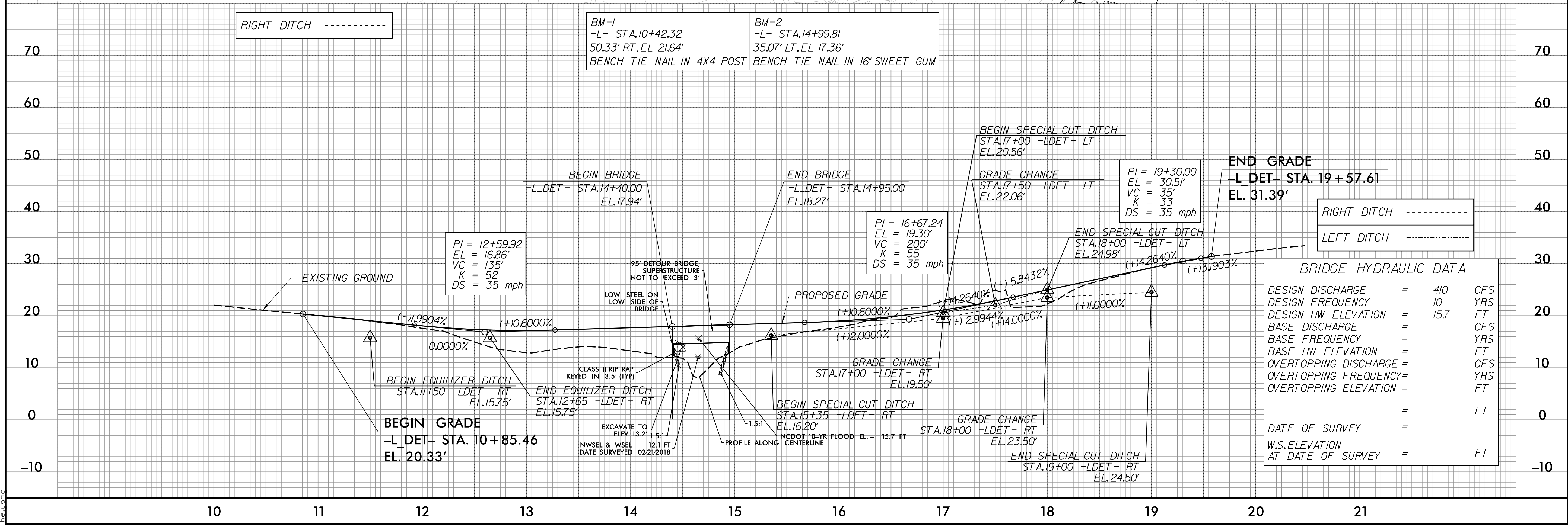
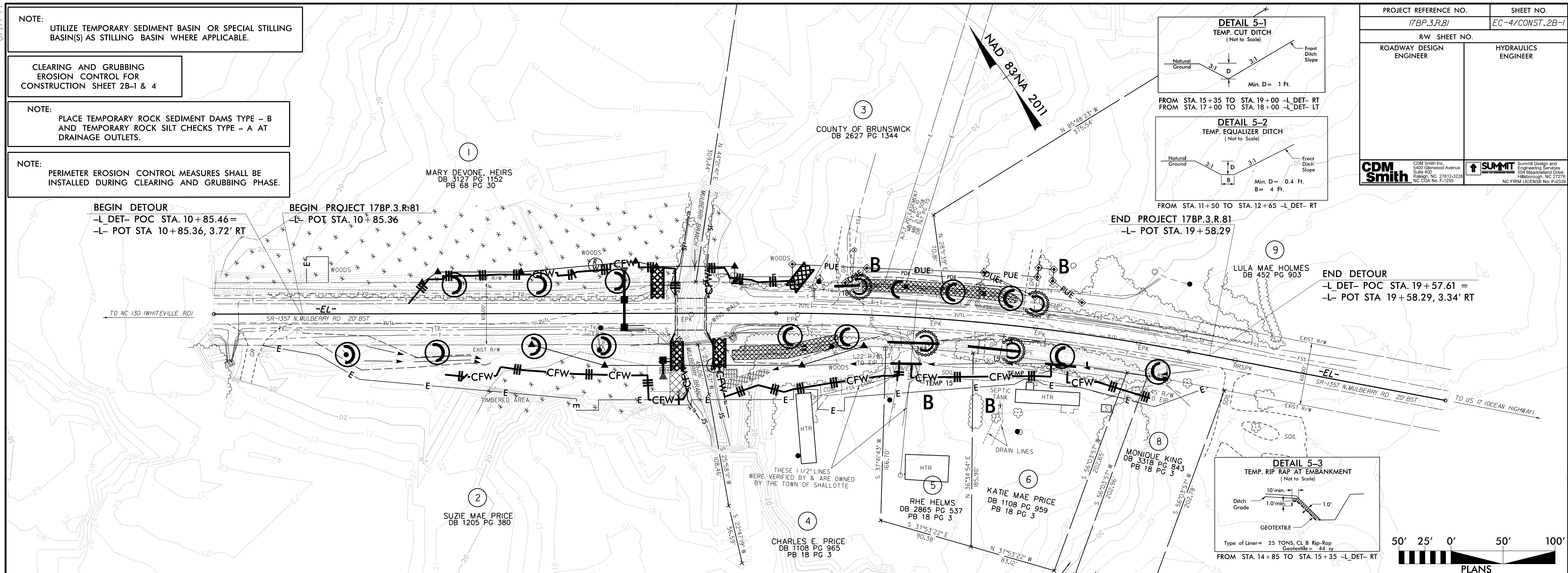
NOTE:
UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 2B-1 & 4

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B
AND TEMPORARY ROCK SILT CHECKS TYPE - A AT
DRAINAGE OUTLETS.

NOTE:
PERIMETER EROSION CONTROL MEASURES SHALL BE
INSTALLED DURING CLEARING AND GRUBBING PHASE.

PROJECT REFERENCE NO. 17BP.3.R.81	SHEET NO. EC-4/CONST.2B-1
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CDM Smith CDM Smith Inc. 5405 Glenwood Avenue Suite 400 Raleigh, NC 27612-3228 NC CDA No. F-1255	SUMMIT Summit Design and Engineering Services 504 Meadowland Drive Hillsborough, NC 27578 NC FIRM LICENSE No. P-03339



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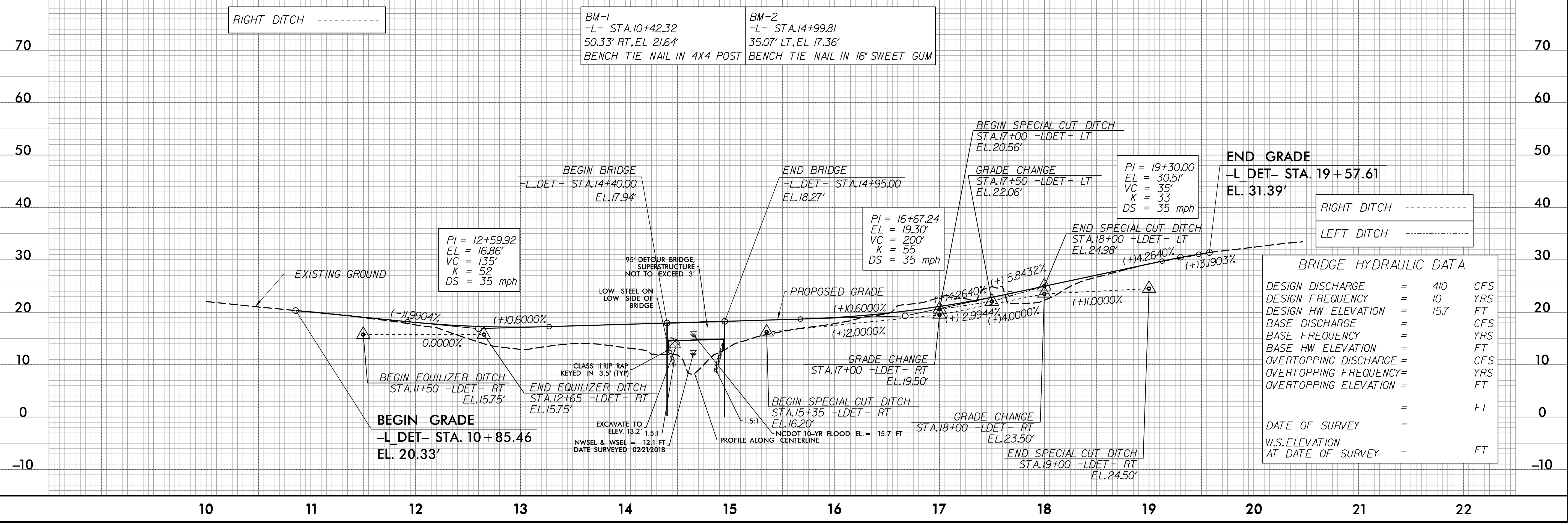
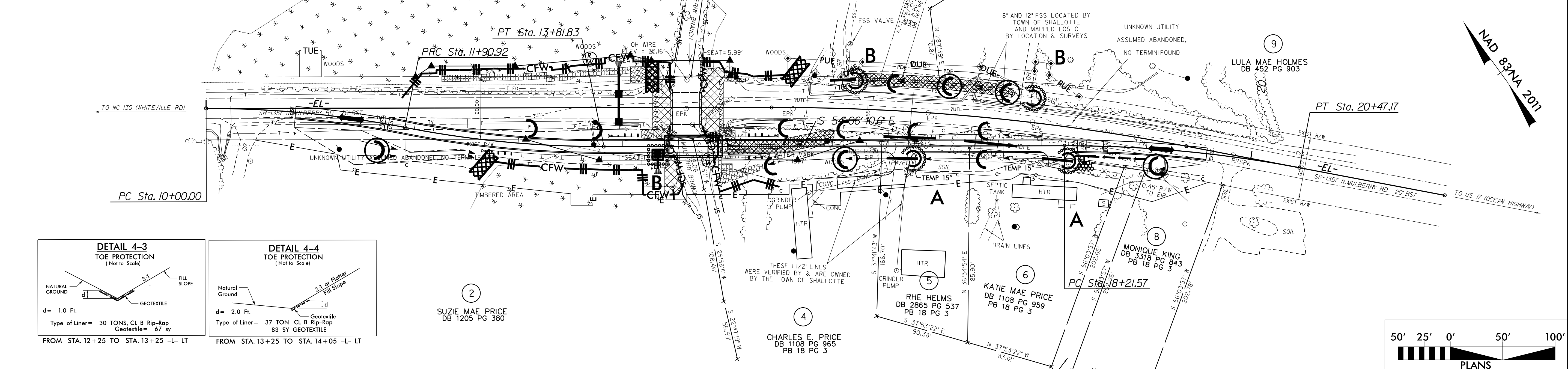
NOTE:
UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

NOTE:
THE OUTSIDE BUFFER, WETLAND, OR WATER BOUNDARY SHALL BE CLEARLY MARKED BY HIGHLY VISIBLE FENCING (ORANGE SAFETY FENCE)

PHASE 2: FINAL PAVING EROSION CONTROL FOR DETOUR (CONST SHT 2B-1)

NOTE:
UTILIZE COIR FIBER MATTING ADJACENT TO WETLANDS/JURISDICTIONAL AREAS, AND AS DIRECTED.

PROJECT REFERENCE NO. 17BP.3.R.B1	SHEET NO. EC-5/CONST.2B-1
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CDM Smith	SUMMIT



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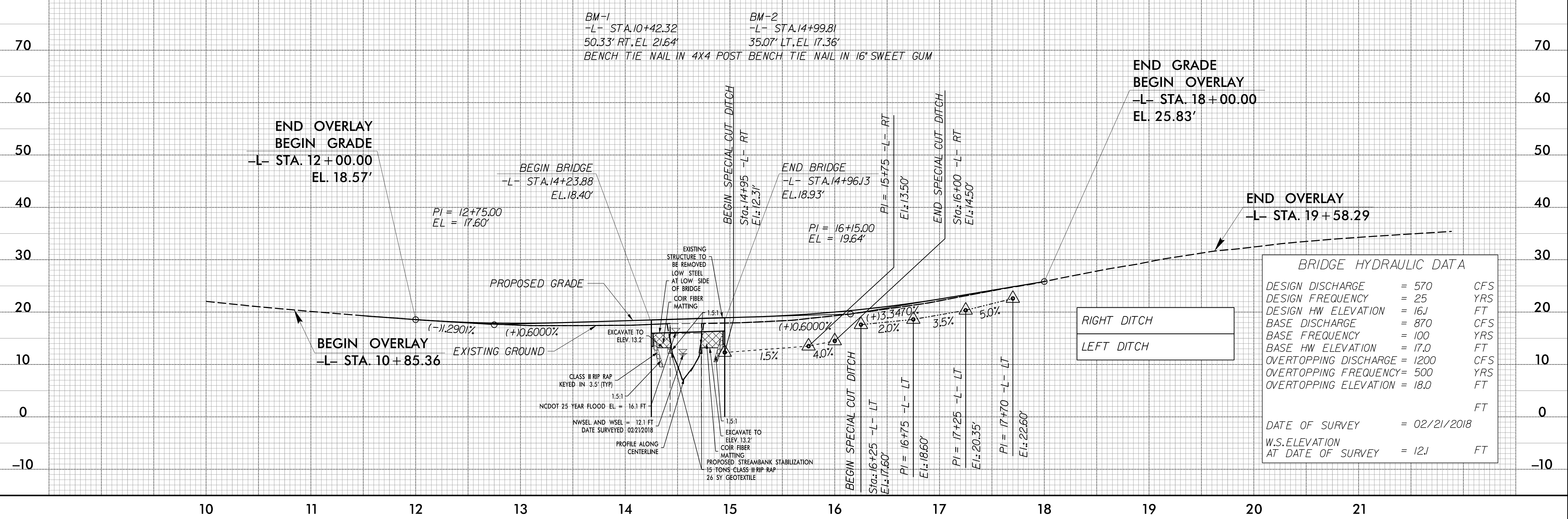
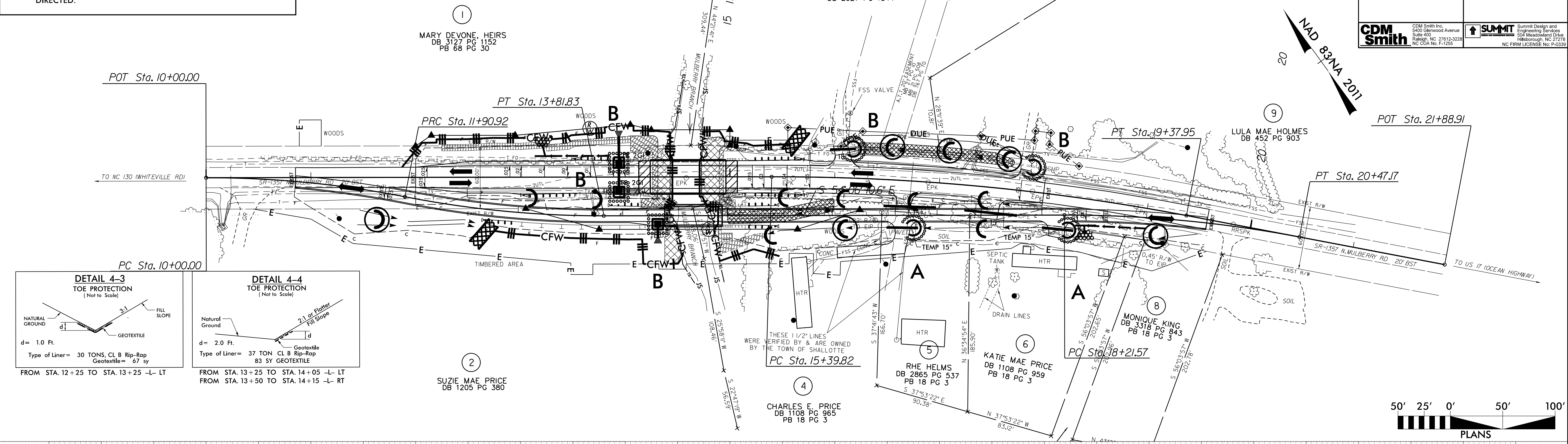
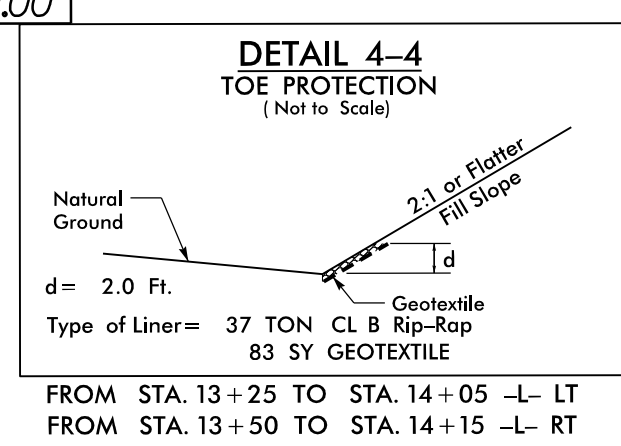
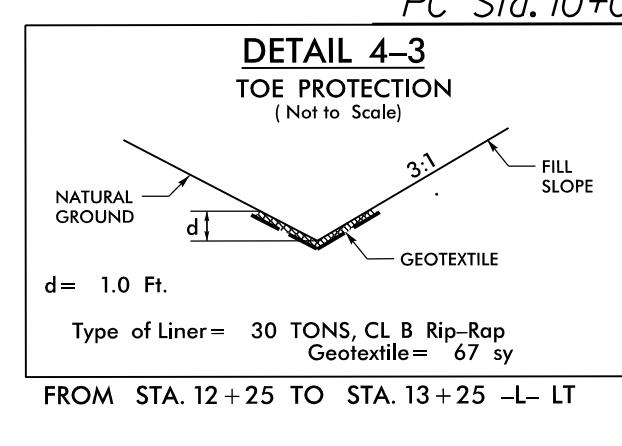
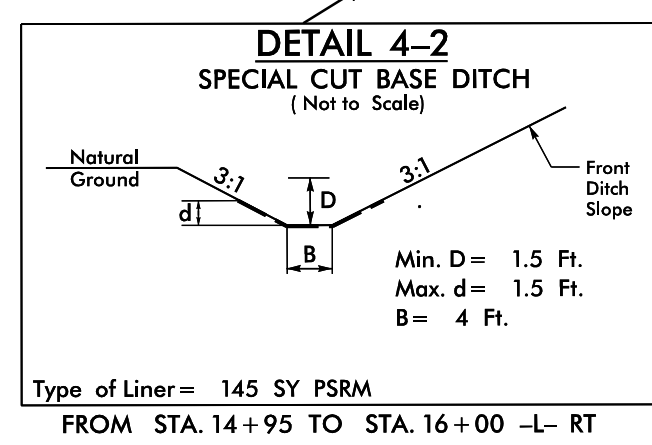
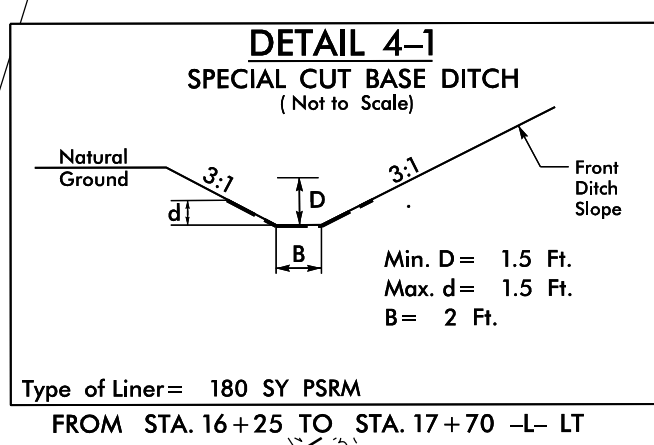
8.17.19

NOTE:
UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

PHASE 3: FINAL PAVING
EROSION CONTROL FOR
MAIN ROAD (CONST SHT 4)

NOTE:
UTILIZE COIR FIBER MATTING ADJACENT TO
WETLANDS/JURISDICTIONAL AREAS, AND AS
DIRECTED.

PROJECT REFERENCE NO. 17BP.3.R.81	SHEET NO. EC-6/CONST.4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CDM Smith CDM Smith Inc. 5405 Glenwood Avenue Suite 400 Raleigh, NC 27612-3228 NC CDA No. F-1255	SUMMIT Summit Design and Engineering Services 504 Measland Drive Hillsborough, NC 27778 NC FIRM LICENSE No. P-0339



DESIGN DISCHARGE	= 570	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 16.1	FT
BASE DISCHARGE	= 870	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 17.0	FT
OVERTOPPING DISCHARGE	= 1200	CFS
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING ELEVATION	= 18.0	FT
DATE OF SURVEY	= 02/21/2018	
W.S. ELEVATION AT DATE OF SURVEY	= 12.1	FT

08. MAR. 2022, 08:25
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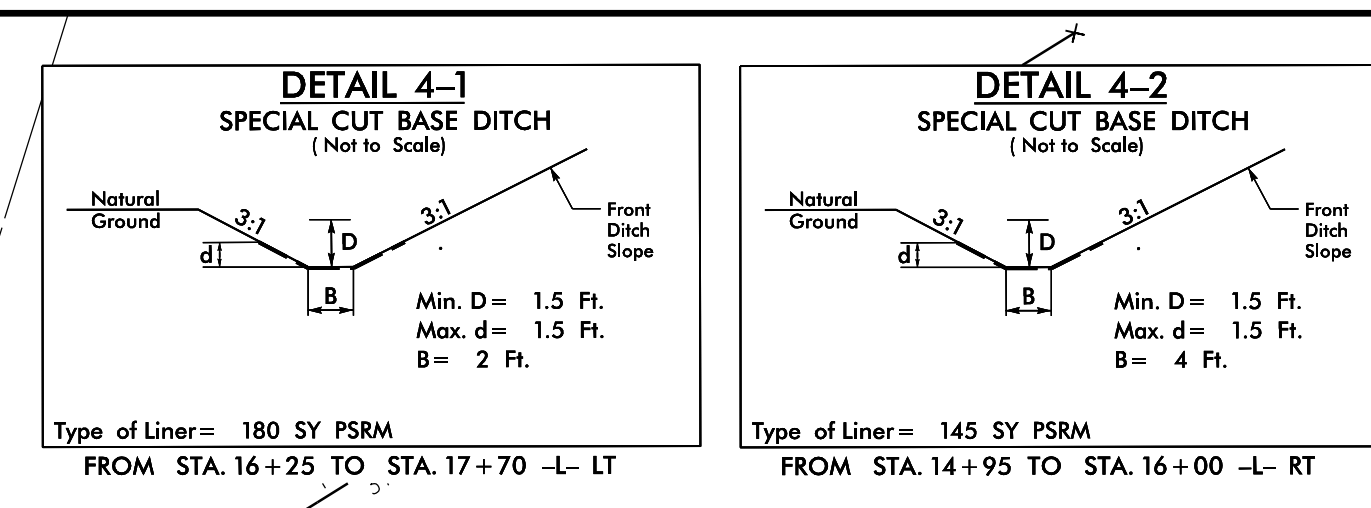
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NOTE:
UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

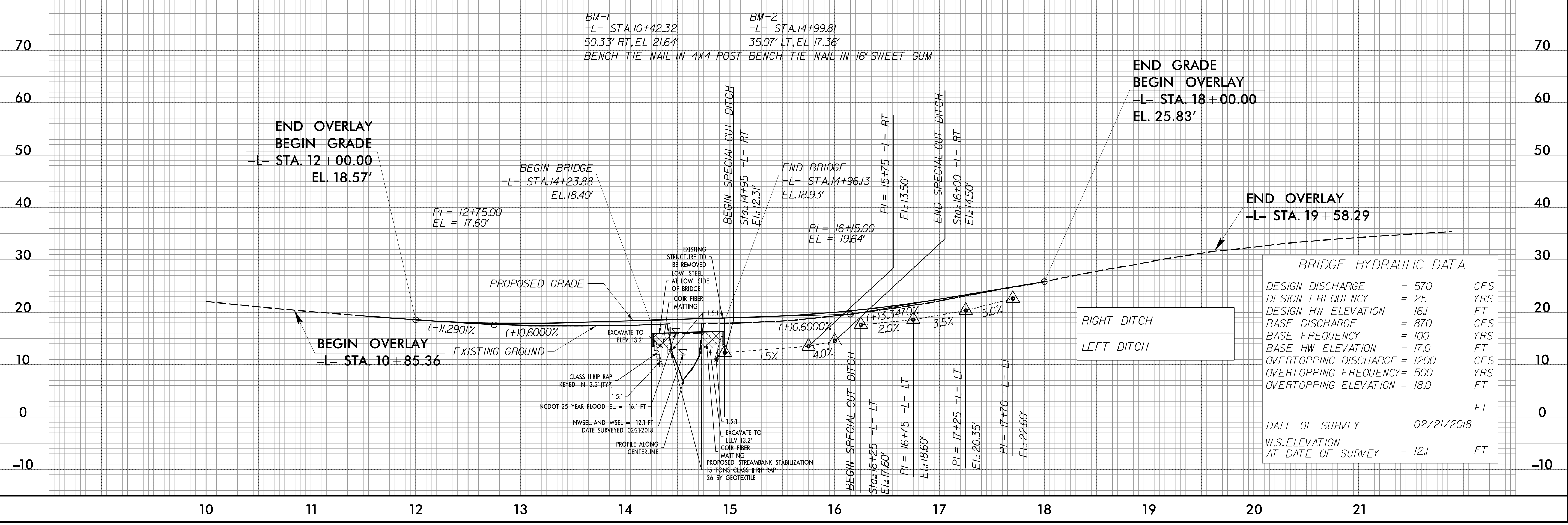
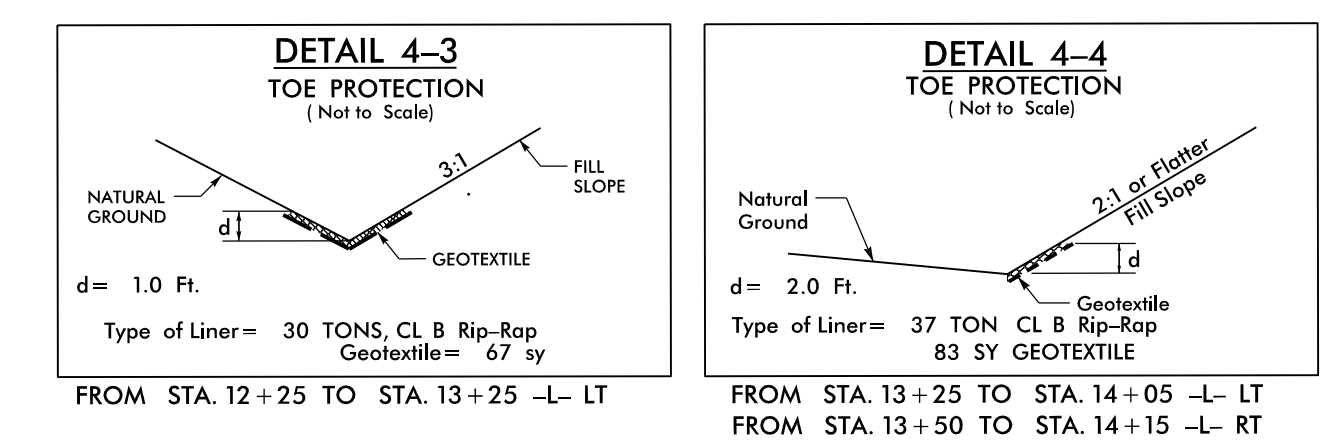
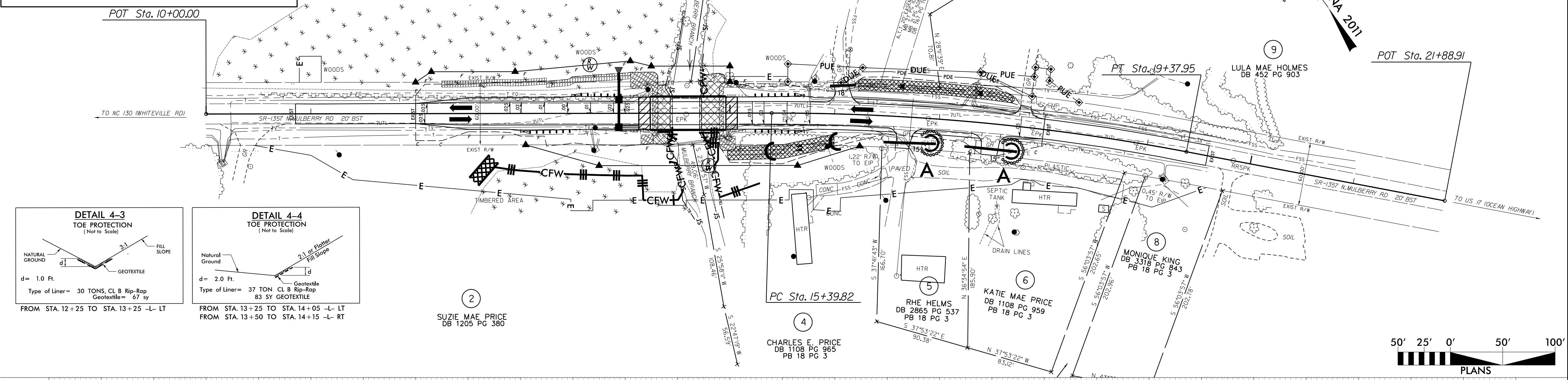
NOTE:
THE OUTSIDE BUFFER, WETLAND, OR WATER BOUNDARY SHALL BE CLEARLY MARKED BY HIGHLY VISIBLE FENCING (ORANGE SAFETY FENCE)

PHASE 4: DEMOLITION EROSION CONTROL FOR DETOUR (CONST SHT 2B-1)

NOTE:
UTILIZE COIR FIBER MATTING ADJACENT TO WETLANDS/JURISDICTIONAL AREAS, AND AS DIRECTED.



PROJECT REFERENCE NO. 17BP.3.R.81	SHEET NO. EC-7/CONST.4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CDM Smith 5405 Glenwood Avenue Suite 400 Raleigh, NC 27612-3228 NC CDA No. P-1255	SUMMIT Summit Design and Engineering Services 504 Meadowland Drive Hillsborough, NC 27778 NC FIRM LICENSE No. P-0339



09. MAR. 2022, 08:25
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PROJECT: 17BP.3.R.81

CONTRACT: DC000313

\$\$\$\$\$ SYSTEM \$\$\$\$\$\$
\$\$\$\$\$ DDN \$\$\$\$\$\$
\$\$\$\$\$ USERNAME \$\$\$\$\$\$

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

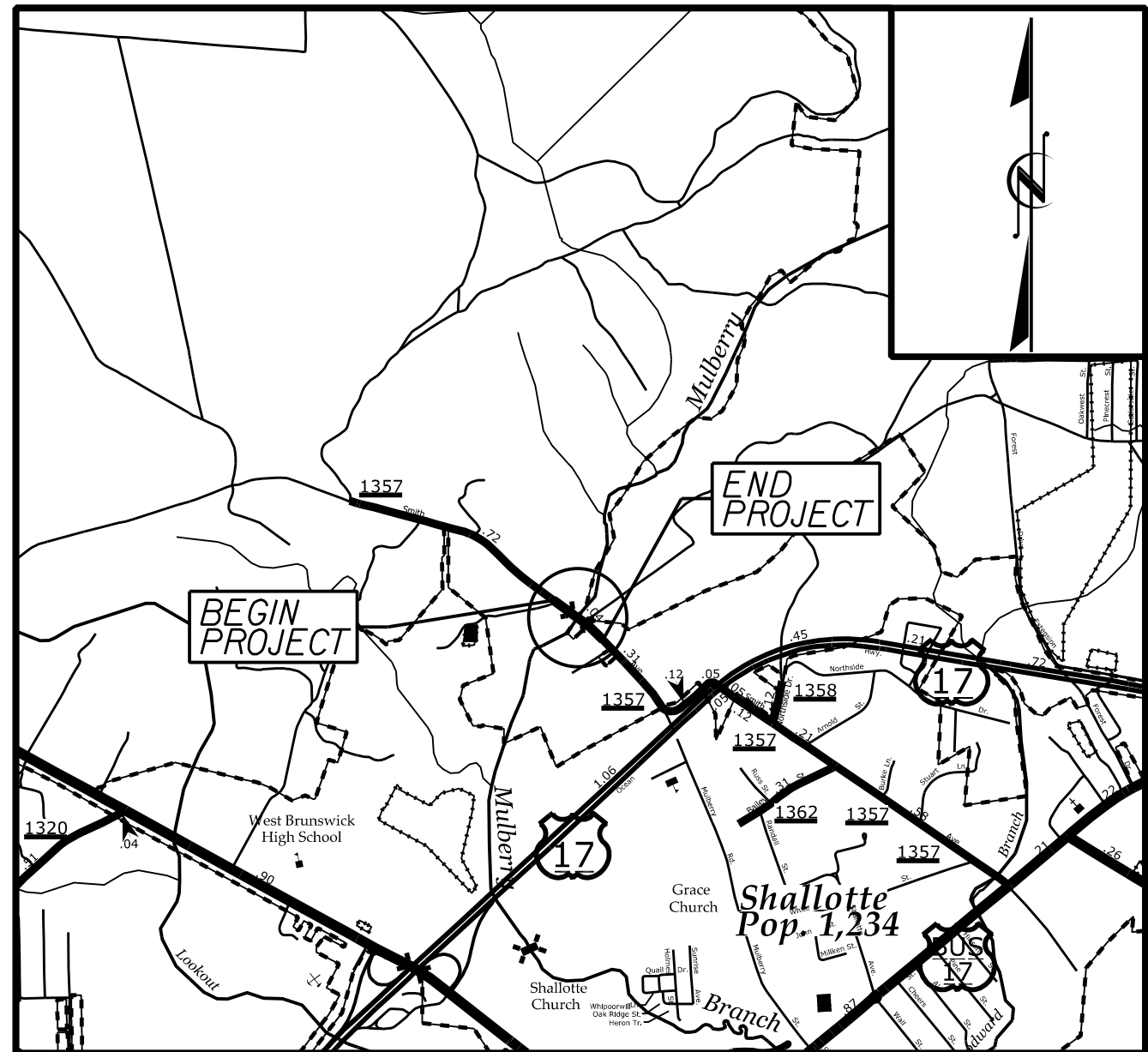
**UTILITIES BY OTHERS PLANS
BRUNSWICK COUNTY**

**LOCATION: REPLACE BRIDGE 202 OVER MULBERRY BRANCH
ON SR 1357 (N MULBERRY ROAD)**

TYPE OF WORK: POWER AND COMMUNICATIONS

T.I.P. NO.	SHEET NO.
17BP.3.R.81	UO-1

NOTE:
ALL UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.

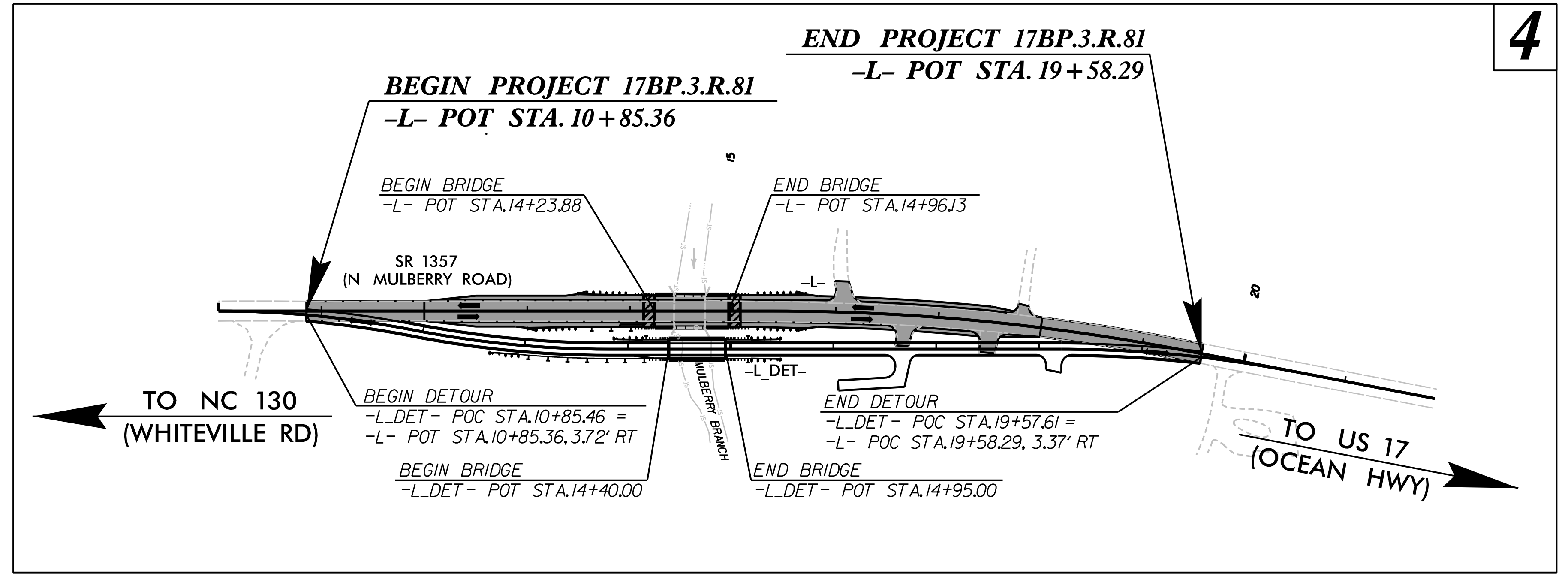


VICINITY MAP

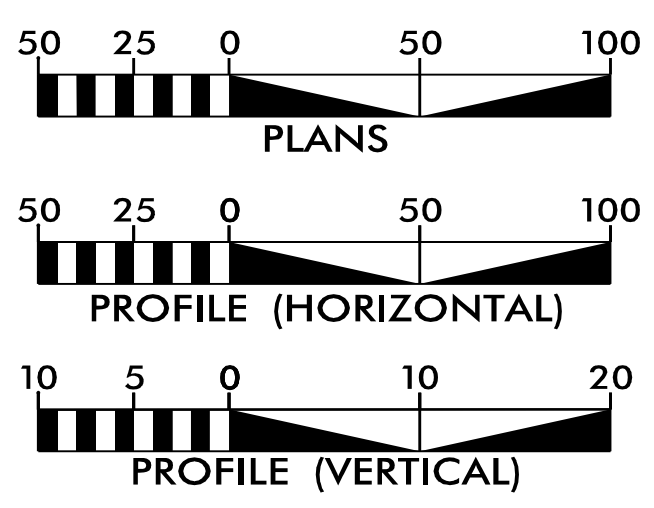
N.T.S.

UO-2

4



GRAPHIC SCALES



INDEX OF SHEETS

SHEET NO.:	DESCRIPTION:
UO-1	TITLE SHEET
UO-2	UBO PLAN SHEET

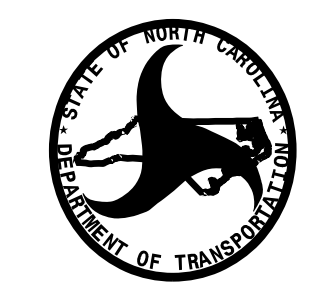
UTILITY OWNERS WITH CONFLICTS

- (A) POWER - BRUNSWICK ELECTRIC
- (B) COMMUNICATIONS - AT&T
- (C) COMMUNICATIONS - ATMC

PREPARED IN THE OFFICE OF:

SAI 2641 Sumner Boulevard
Suite 116
Raleigh, NC 27616
(919) 878-7466

Freddie Bunn UTILITY PROJECT MANAGER
Matthew Ward PROJECT UTILITY COORDINATOR

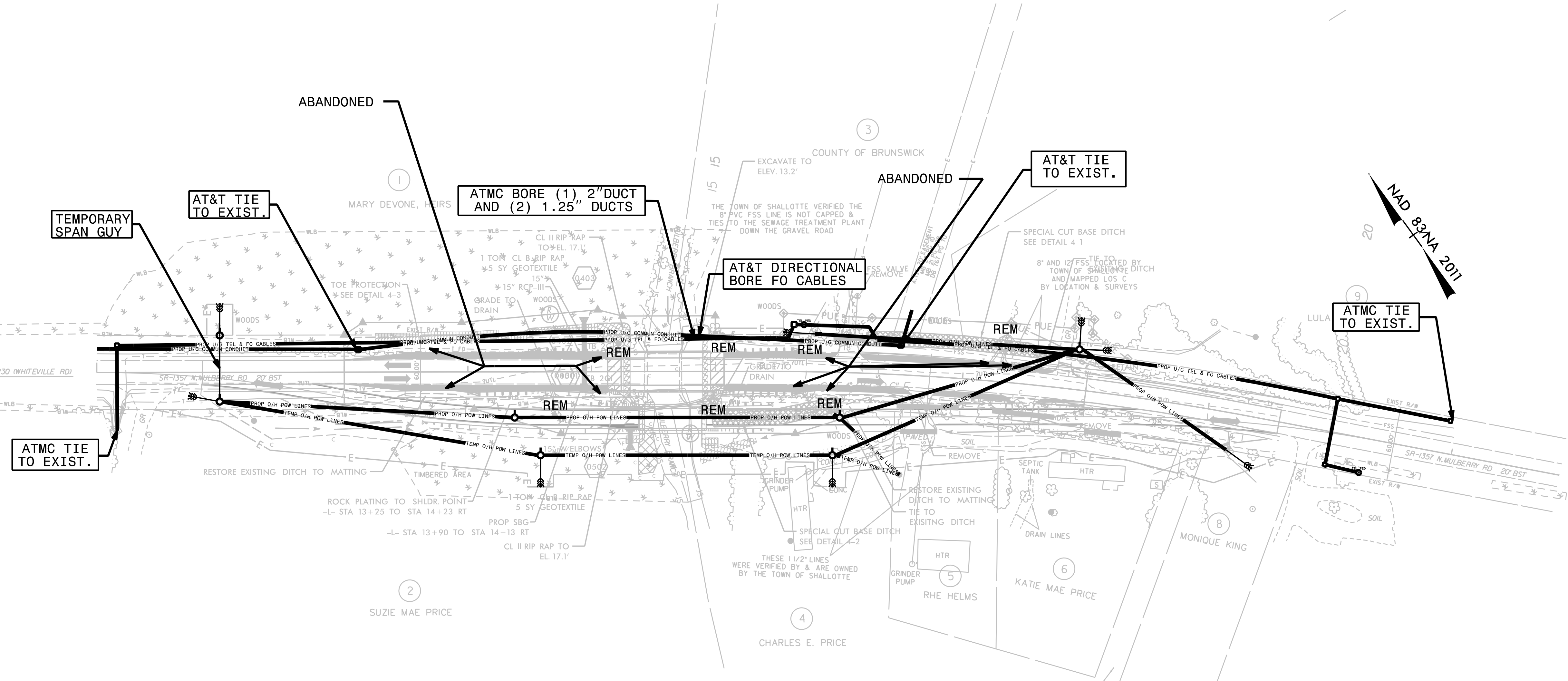


**DIVISION OF HIGHWAYS
DIVISION 03**
DIV ADDRESS
5501 Barbados Blvd.
Castle Hayne, NC 28429

Derek Pielech, PE DIVISION CONTACT #1
Lonny Sleeper DIVISION CONTACT #2
Ben Meyer, PE DIVISION CONTACT #3

UTILITIES BY OTHERS

ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.



5/14/99

45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

CROSS SECTION SHEET INDEX

X-1 CROSS SECTION SHEET INDEX
X-2 THRU X-5 -L-
X-6 THRU X-10 -L_DET-

Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJ. REFERENCE NO.	SHEET NO.
17BP.3.R.81	X-1A

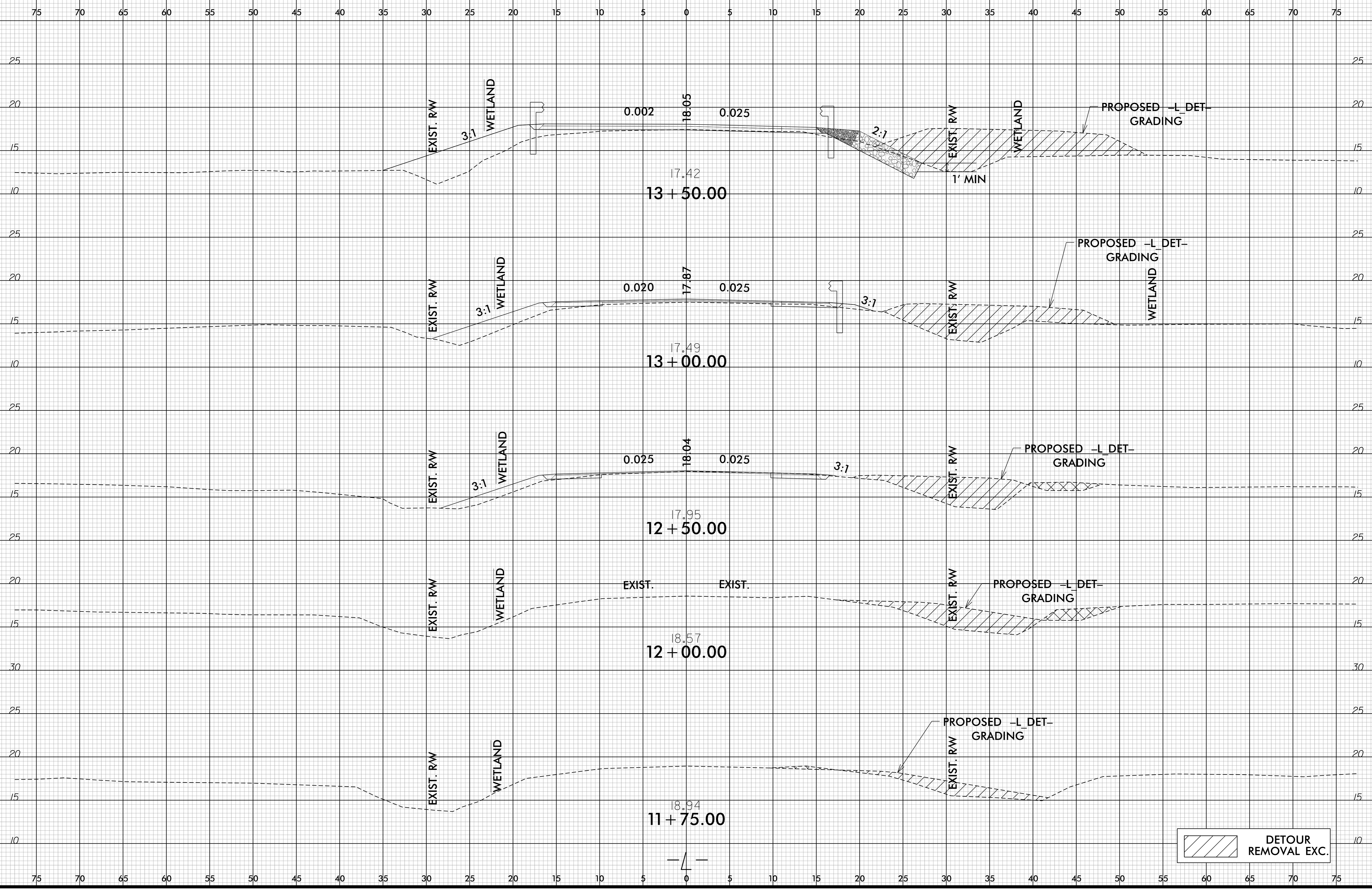
Approximate quantities only. Unclassified excavation, borrow excavation, shoulder borrow, fine grading, clearing and grubbing, breaking of existing pavement and removal of existing pavement will be paid for at the lump sum price for "Grading".

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

CROSS-SECTION SUMMARY

Station	Uncl. Exc.	Embt	Station	Uncl. Exc.	Embt
L	(cu. yd.)	(cu. yd.)	L_Det	(cu. yd.)	(cu. yd.)
12+50.00	0	0	14+00.00	0	193
13+00.00	4	28	14+40.00	0	173
13+50.00	1	59			
14+00.00	0	122			
14+23.88	0	74			
			Station	Uncl. Exc.	Embt
			L_Det	(cu. yd.)	(cu. yd.)
Station	Uncl. Exc.	Embt	14+95.00	0	0
L	(cu. yd.)	(cu. yd.)	15+00.00	0	23
14+96.13	0	0	15+50.00	67	148
15+00.00	0	6	16+00.00	118	69
15+50.00	0	81	16+50.00	83	35
16+00.00	0	55	17+00.00	80	20
16+50.00	13	26	17+50.00	110	11
17+00.00	24	20	18+00.00	86	30
17+50.00	36	18	18+50.00	54	56
			19+00.00	79	50
			19+50.00	57	24
Station	Uncl. Exc.	Embt			
L_Det	(cu. yd.)	(cu. yd.)			
11+00.00	0	0			
11+50.00	20	0			
12+00.00	20	29			
12+50.00	18	58			
13+00.00	6	78			
13+50.00	0	123			
14+00.00	0	177			
14+40.00	0	157			
Station	Uncl. Exc.	Embt			
L_Det	(cu. yd.)	(cu. yd.)			
14+95.00	0	0			
15+00.00	0	24			
15+50.00	68	176			
16+00.00	122	85			
16+50.00	91	35			
17+00.00	93	15			
17+50.00	142	8			
18+00.00	111	22			
18+50.00	56	41			
19+00.00	87	41			
19+50.00	71	22			
Station	Uncl. Exc.	Embt			
L_Det	(cu. yd.)	(cu. yd.)			
11+00.00	0	0			
11+50.00	4	1			
12+00.00	8	35			
12+50.00	14	73			
13+00.00	6	96			
13+50.00	0	139			

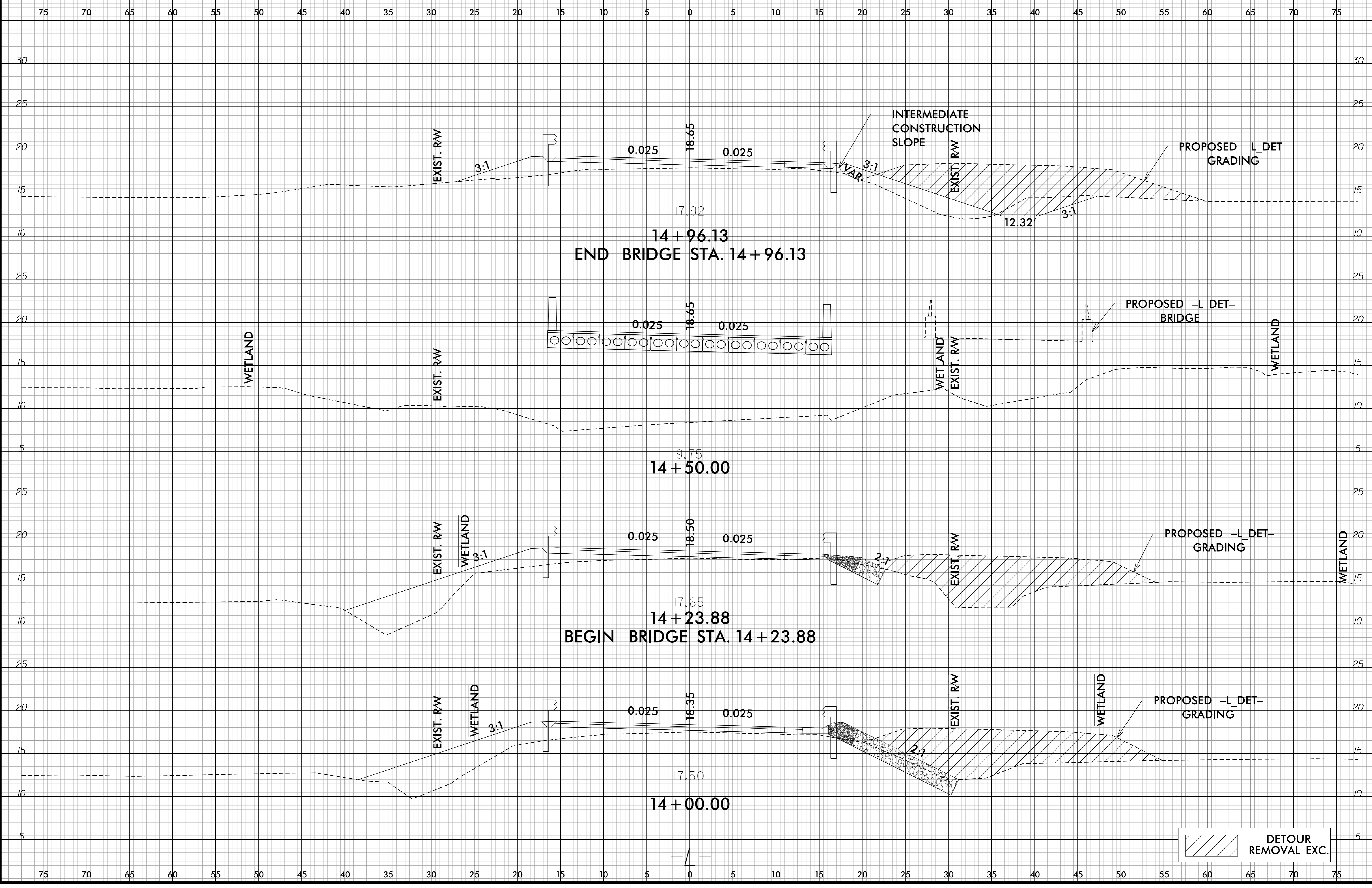
6/23/16



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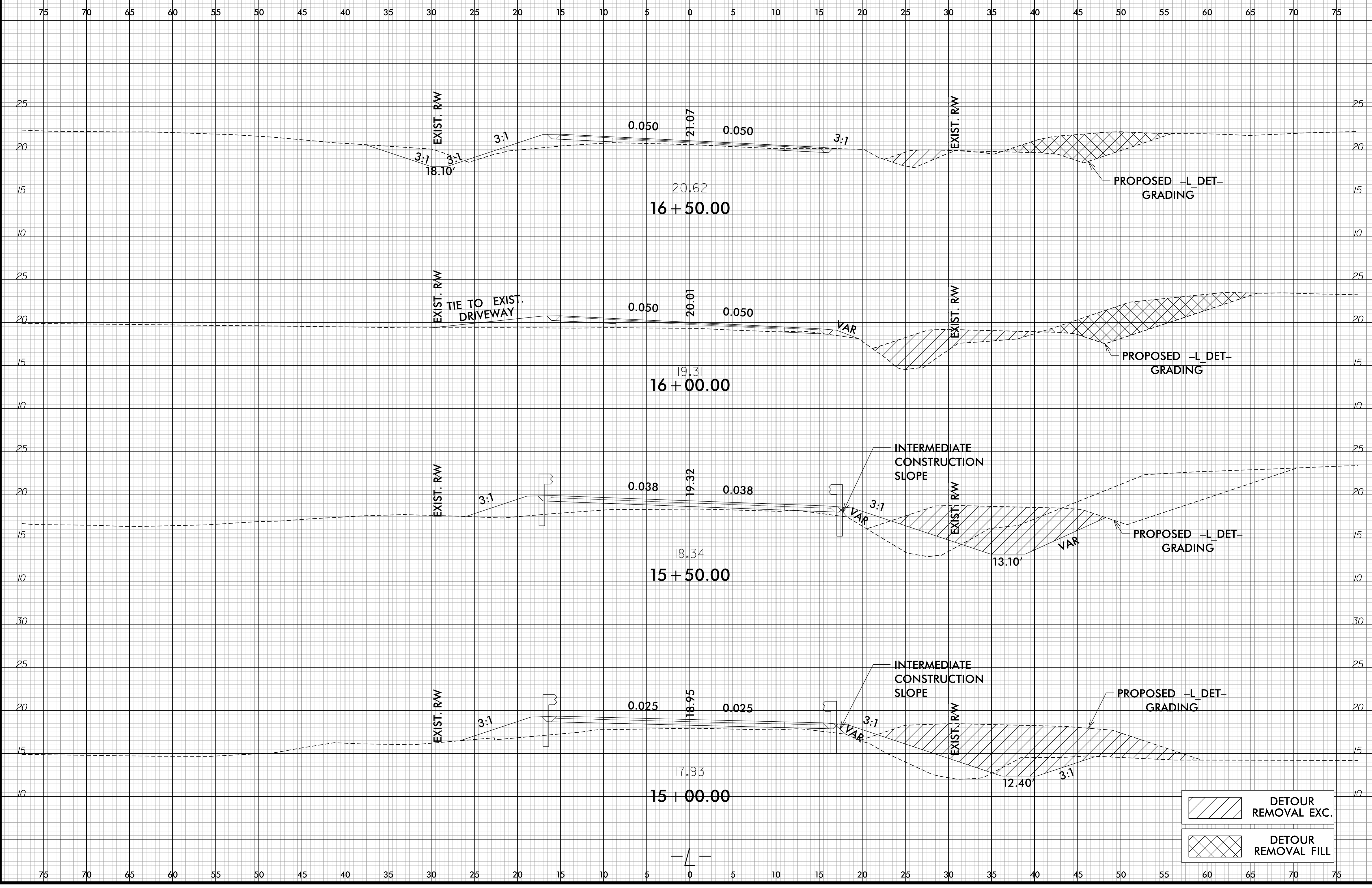
6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.3.R.81	X-3



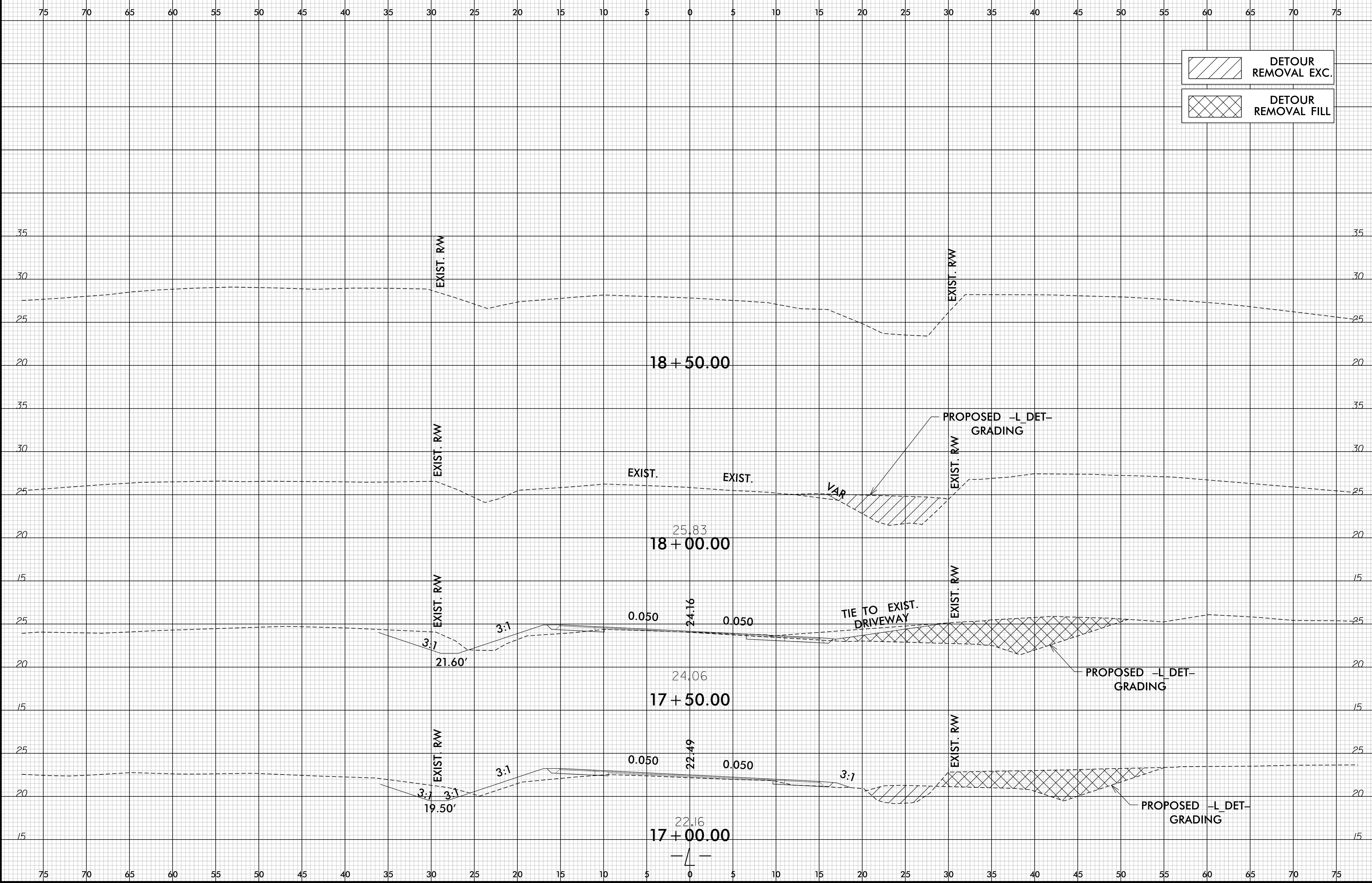
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17BP.3.R.81.dgn

6/23/16



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USER:DEWINDR

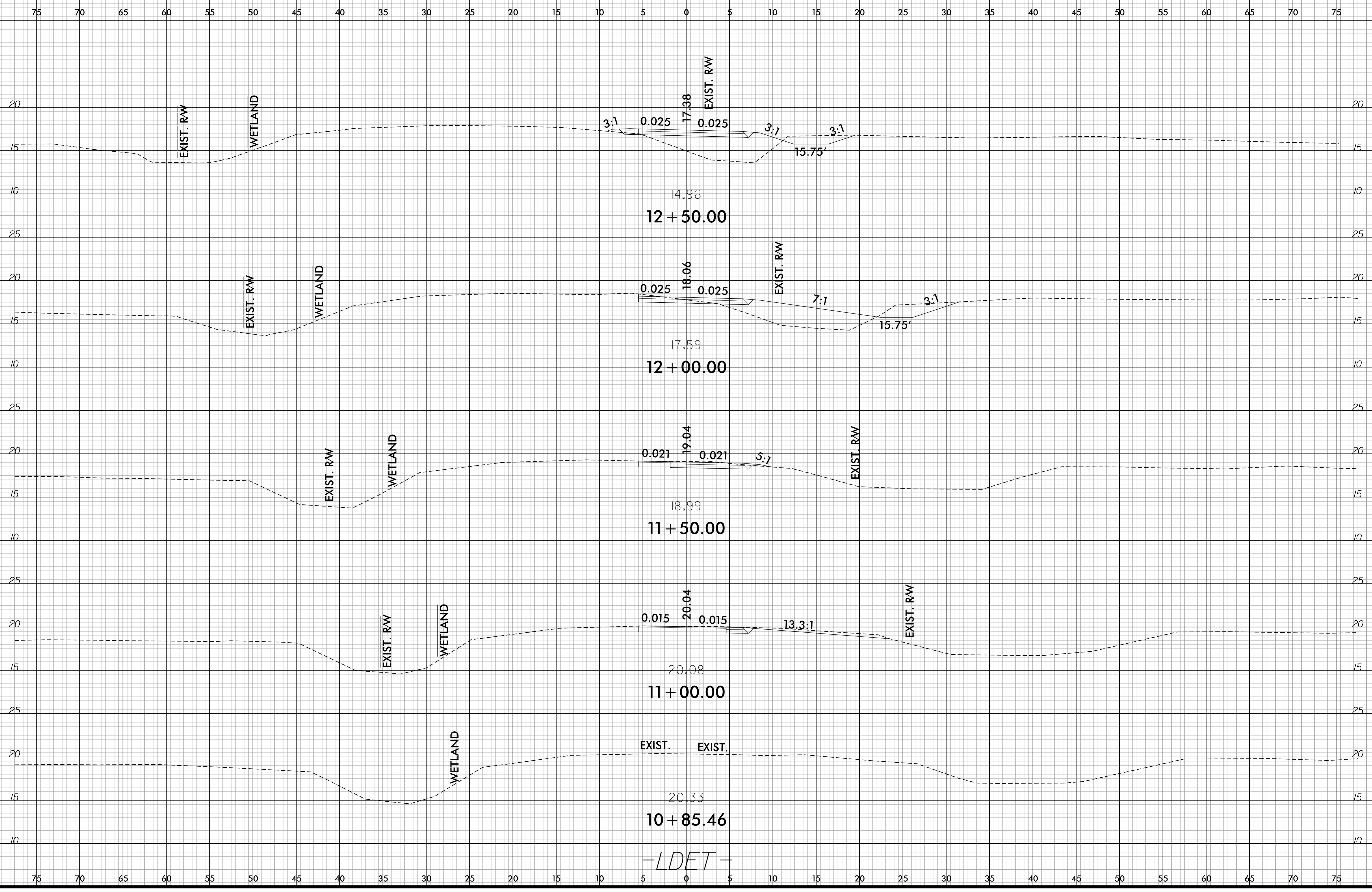
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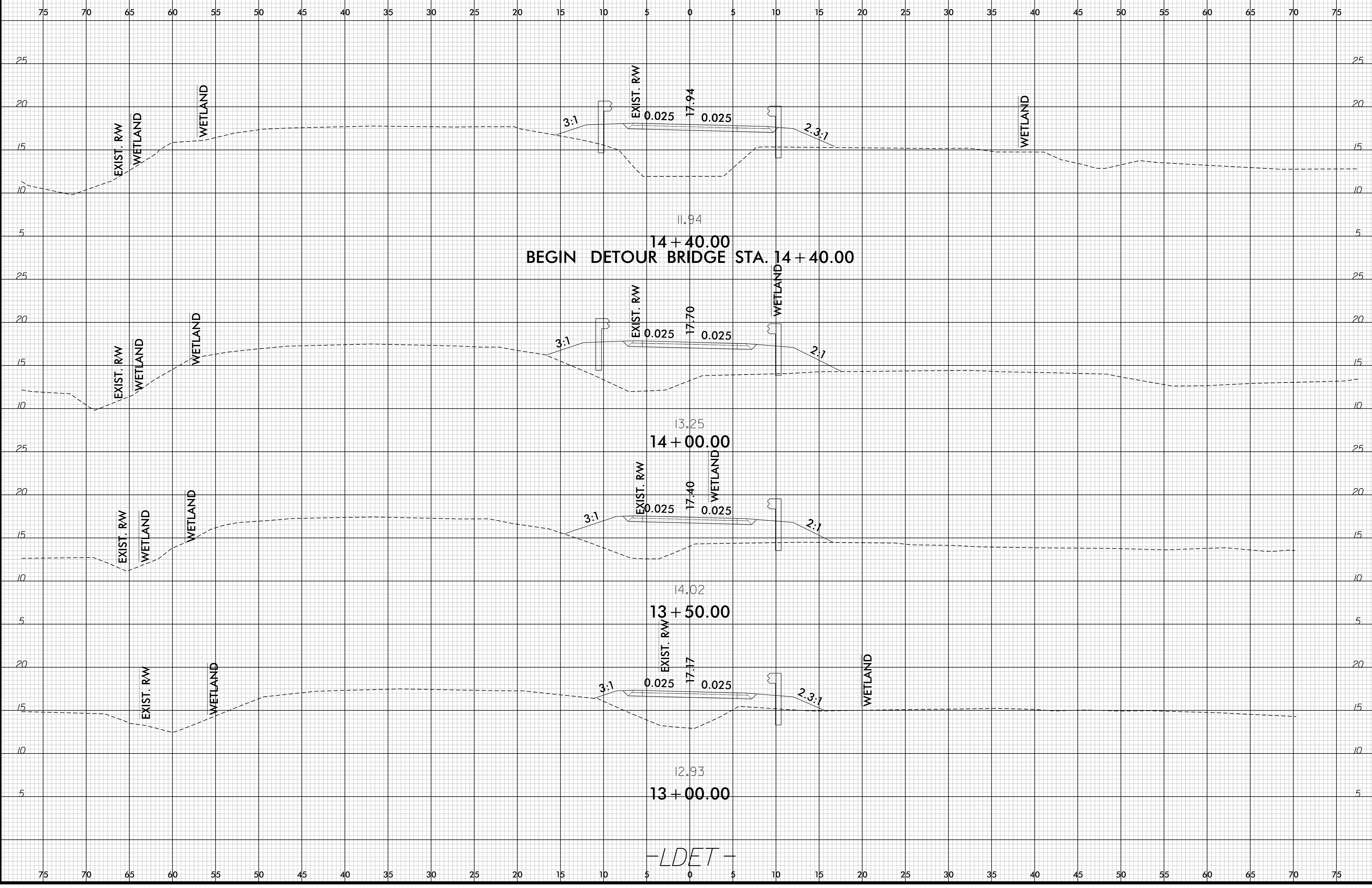
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	17BP.3.R.81	X-6



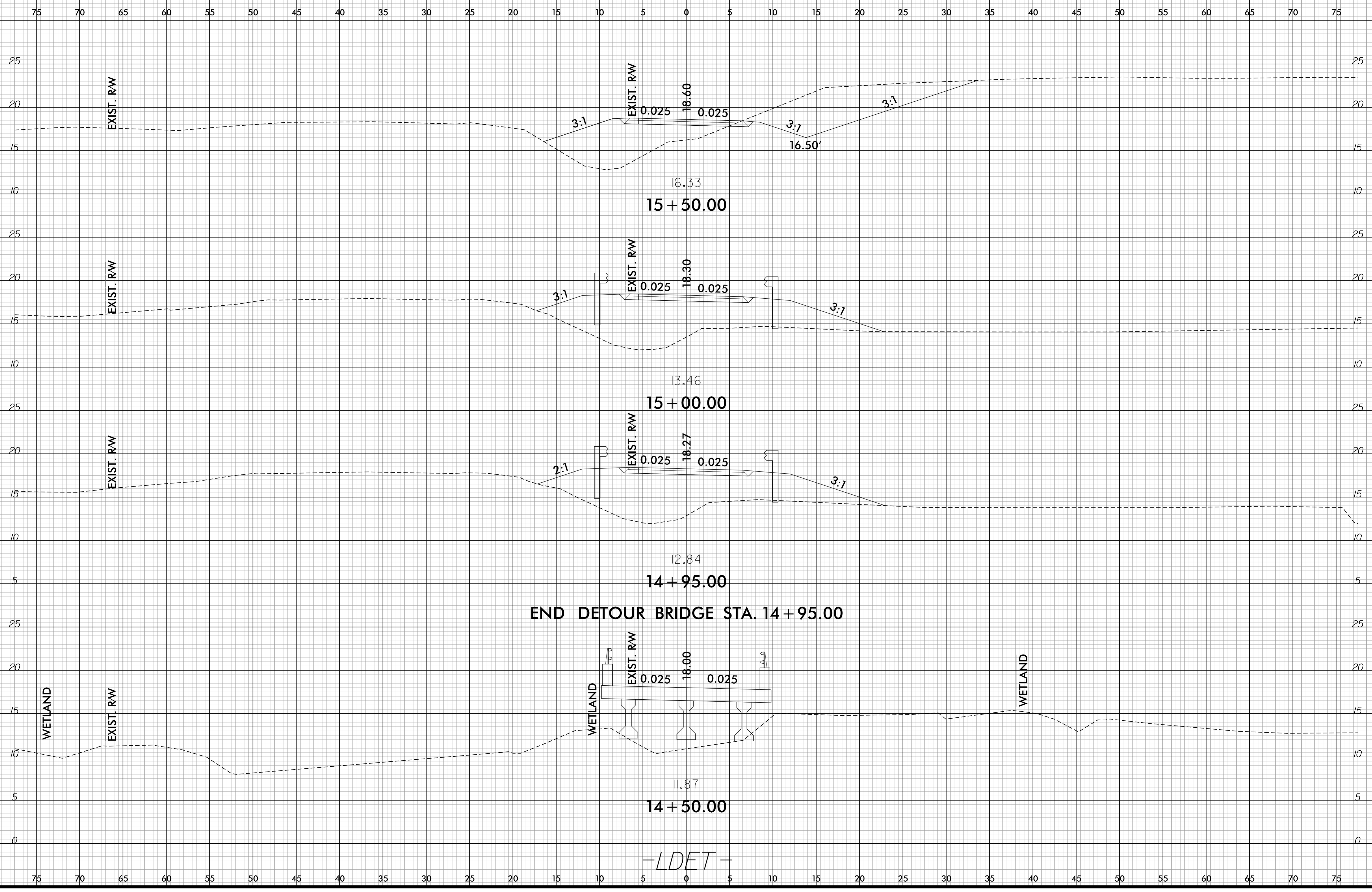
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6/23/16



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6/23/16

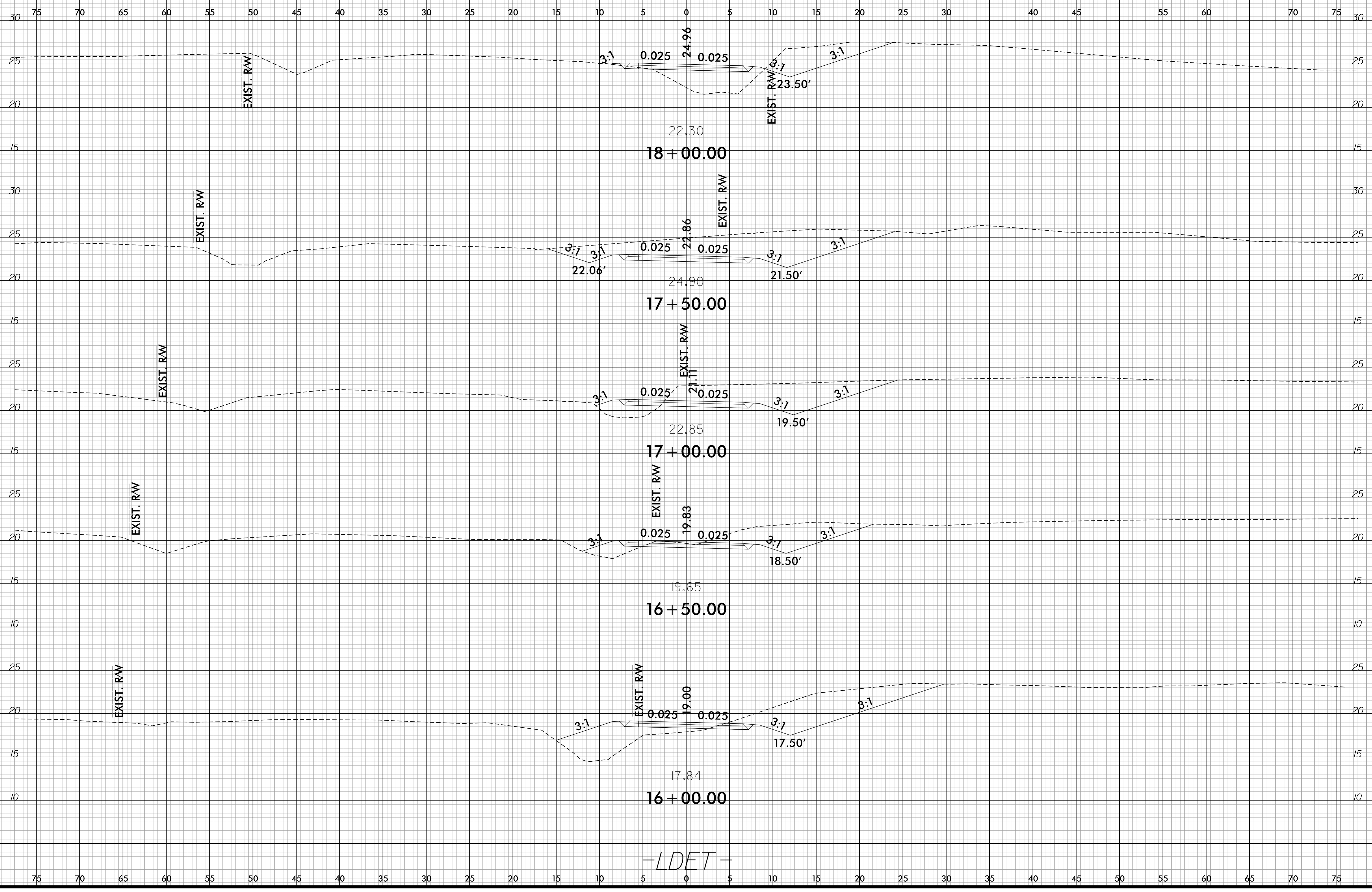


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USER:DEWINDCR

END DETOUR BRIDGE STA. 14 + 95.00

-LDET-

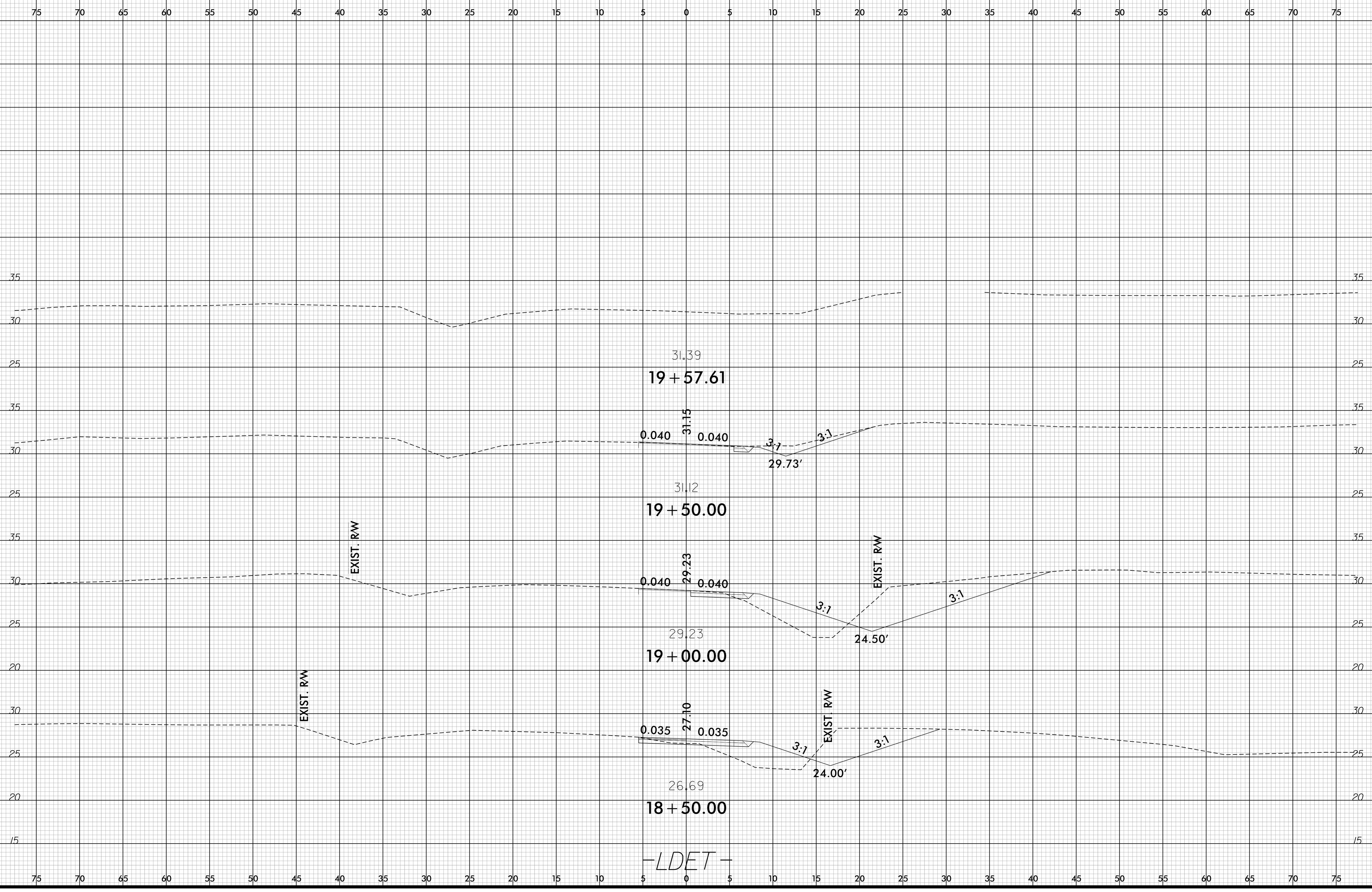
6/23/16



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-LDET-

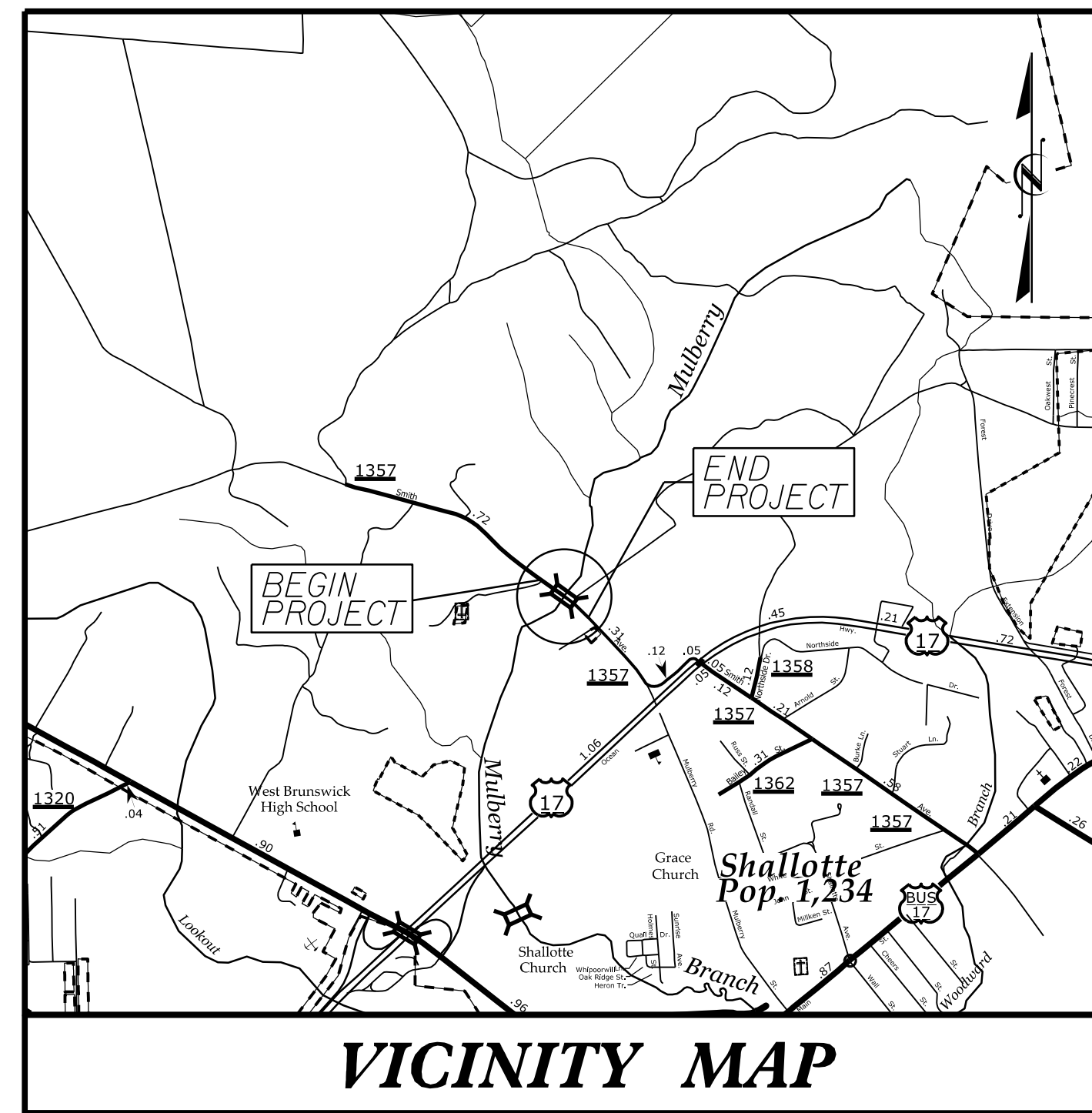
6/23/16



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USER:DEWINDICKR

PROJECT: 17BP.3.R.81
CONTRACT: DC00313

STRUCTURE



VICINITY MAP

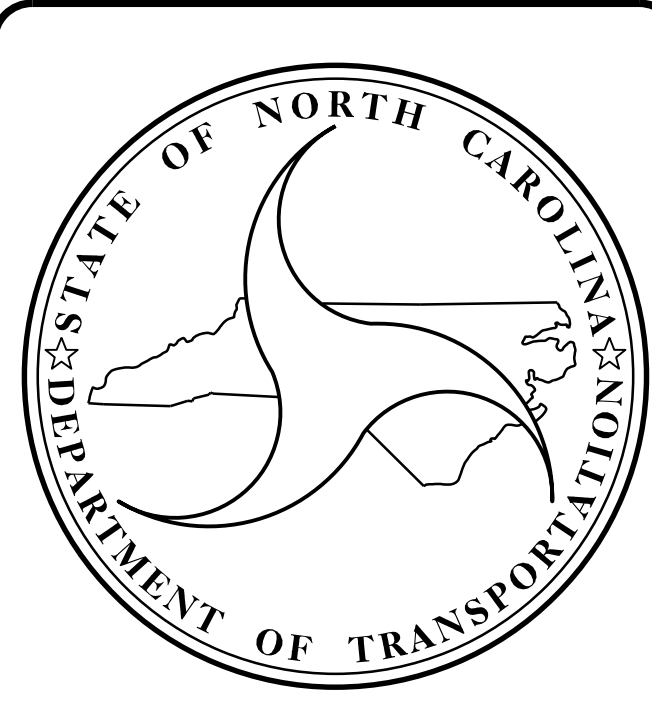
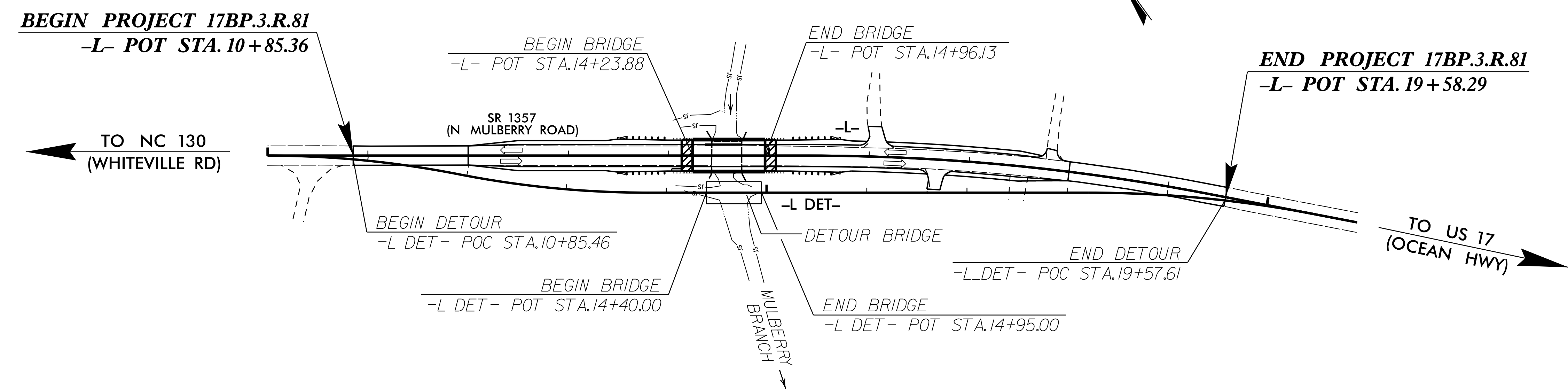
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BRUNSWICK COUNTY

LOCATION: REPLACE BRIDGE 202 OVER MULBERRY BRANCH ON SR 1357 (N MULBERRY ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.3.R.81 (FORMERLY B-5540)		14
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.3.PE.81	N/A	P.E.	
17BP.3.ROW.81	N/A	UTIL. & ROW	
17BP.3.R.81	N/A	CONSTR.	



DESIGN DATA

ADT 2019	=	436 VPD
ADT 2040	=	700 VPD
K	=	N/A %
D	=	N/A %
T	=	9 % *
V	=	60 MPH
* TTST	=	1 % DUAL 8%
FUNC CLASS	=	LOCAL
SUB-REGIONAL TIER		

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT 17BP.3.R.81	=	0.151 MILES
LENGTH STRUCTURE TIP PROJECT 17BP.3.R.81	=	0.014 MILES
TOTAL LENGTH OF TIP PROJECT 17BP.3.R.81	=	0.165 MILES

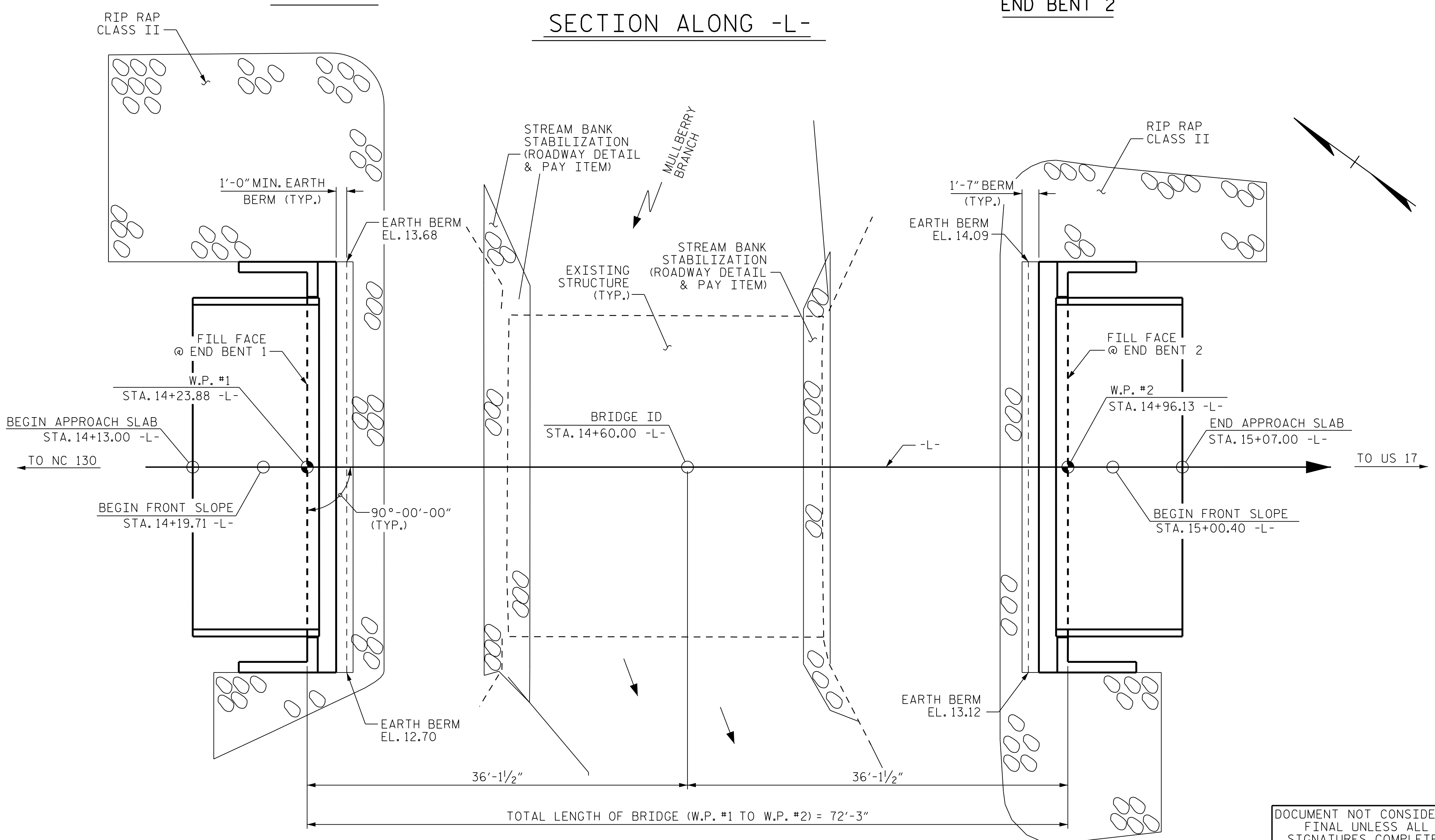
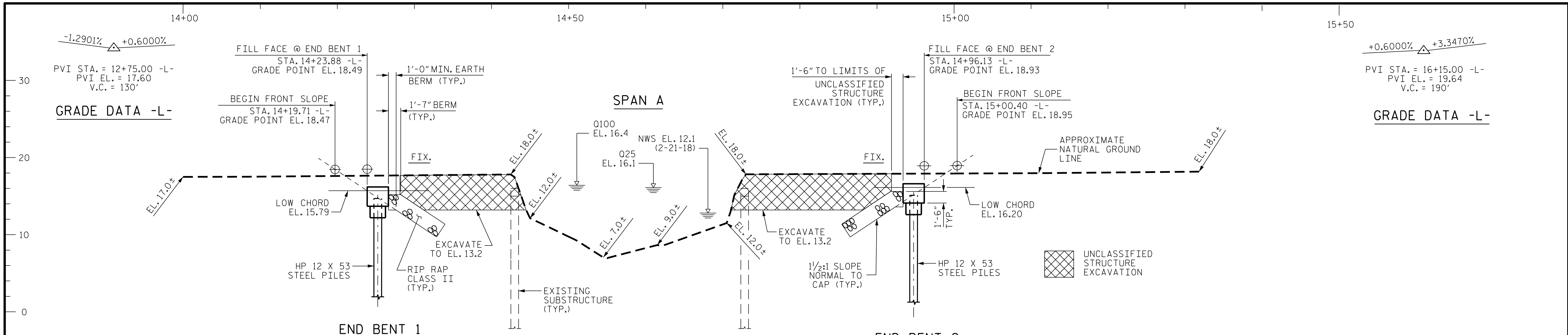
Prepared in the Office of:
CDM Smith
5400 Glenwood Avenue, Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255
FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

LETTING DATE : MAY 26, 2022

DAVID Z. KEISER, PE PROJECT ENGINEER	
TING H. FANG, P.E. PROJECT DESIGN ENGINEER	

DocuSigned by:
Ting Fang
60E43C0AEAB0462
4/26/2022



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. 17BP.3.R.81
 BRUNSWICK COUNTY
 STATION: 14+60.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 202

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER
 MULLBERRY BRANCH ON SR 1357
 BETWEEN NC 130 AND US 17

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CDM Smith
 CDM SMITH
 5400 Glenwood Avenue, Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255

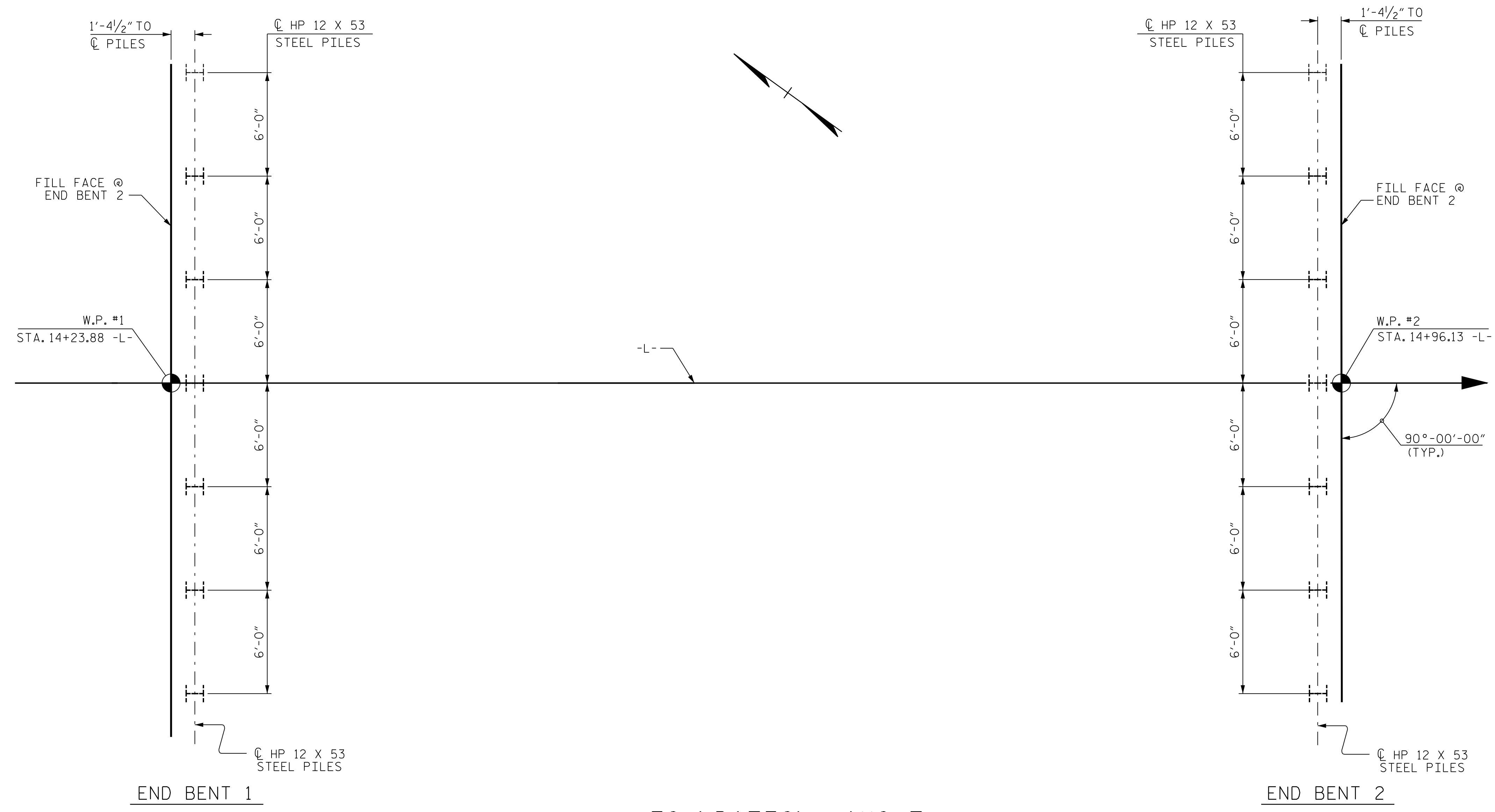
DRAWN BY: VDK DATE: 10/18
 CHECKED BY: THF DATE: 10/18
 DESIGN ENGINEER: VDK DATE: 11/18

DWG. No.



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-01
1			3			TOTAL SHEETS
2			4			14

FILE: SFILES
 DATE: SDATES
 STIMES



FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES.
ALL PILES ARE VERTICAL.

NOTES

- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENTS 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 81 TONS PER PILE.
- DRIVE PILES AT END BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 140 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG OR SCOUR.
- DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 135 TONS PER PILE.
- STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENTS 1 AND 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. 17BP.3.R.81
BRUNSWICK COUNTY
 STATION: 14+60.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE OVER
 MULBERRY BRANCH ON SR 1357
 BETWEEN NC 130 AND US 17

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

CDM Smith
 CDM SMITH
 5400 Glenwood Avenue, Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255



DWG. No. _____
 DRAWN BY : VDK DATE : 10/18
 CHECKED BY : THF DATE : 10/18
 DESIGN ENGINEER : VDK DATE : 11/18

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-02
1			3			TOTAL SHEETS
2			4			14

TOTAL BILL OF MATERIAL																				
	CONST., MAINT. & REMOVAL OF TEMP. STRUCTURE	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS. A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	HP 12 X 53 STEEL PILES	STEEL PILE POINTS	PILE REDRIVES	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLABS	FIBER OPTIC CONDUIT SYSTEM		
	LUMP SUM	LUMP SUM	LUMP SUM	EA.	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	EA.	NO.	LIN. FT.	EA.	EA.	LIN. FT.	TON	SQ. YD.	LUMP SUM	NO.	LIN. FT.	LIN. FT.
SUPERSTRUCTURE														140.0			LUMP SUM	11	770	136
END BENT 1					LUMP SUM	14.4		2,073	7	7	385.0	7	4		95	105				
END BENT 2					LUMP SUM	14.4		2,073	7	7	385.0	7	4		85	95				
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	1	LUMP SUM	28.8	LUMP SUM	4,146	14	14	770.0	14	8	140.0	180	200	LUMP SUM	11	770	136

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

THIS BRIDGE IS LOCATED IN SEISMIC PERFORMANCE ZONE 1.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC-18 EVALUATING SCOUR AT BRIDGES".

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY STRUCTURE AT STATION 14+67.50 -L- DET- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

THE BRIDGE RAILS ON THE TEMPORARY STRUCTURE SHALL BE DESIGNED FOR THE AASHTO LRFD TEST LEVEL 3 (TL-3) CRASH TEST CRITERIA. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 27 FT. LEFT SIDE, 30 FT. RIGHT SIDE AT END BENT 1 AND 37 FT. LEFT SIDE, 30 FT. RIGHT SIDE AT END BENT 2 OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE EXISTING STRUCTURE CONSISTING OF 1 SPAN:1 @ 31'-2" WITH A CLEAR ROADWAY WIDTH OF 29'-3" WITH 3" AWS AND PRESTRESSED CONCRETE CHANNELS; SUBSTRUCTURE CONSISTING OF REINFORCED CONCRETE CAPS ON TIMBER PILES AND A CONCRETE CRUTCH AT END BENTS LOCATED AT THE SITE OF THE PROPOSED BRIDGE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

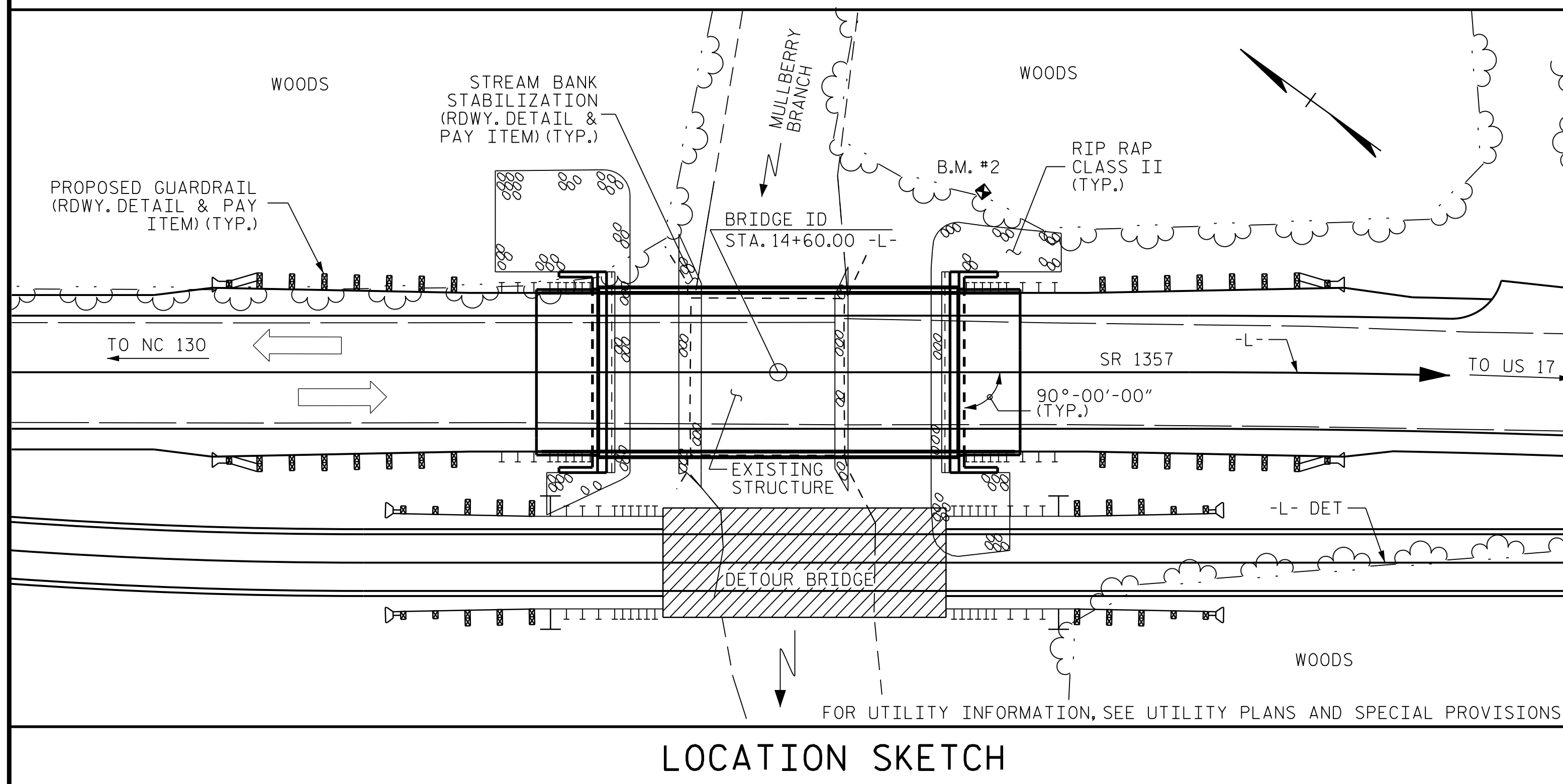
FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

FOR FIBER OPTIC CONDUIT SYSTEM, SEE SPECIAL PROVISIONS.

FOR BRIDGE APPROACH FILLS TYPE 5 GEOTEXTILE SEE SPECIAL PROVISIONS.

ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.

B.M. #2: BENCH TIE NAIL IN 16" SWEET GUM, 35.07' LEFT OF STA. 14+99.81 -L-, EL. 17.36'



LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE	= 570 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YR.
DESIGN HIGH WATER ELEVATION	= 16.1 FT.
DRAINAGE AREA	= 4.03 SQ. MI.
BASE DISCHARGE (Q100)	= 870 CFS
BASE HIGH WATER ELEVATION	= 17.0 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 1200 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 500 YRS.
OVERTOPPING FLOOD ELEVATION	= 17.9 FT. *

*ELEVATION IS TAKEN AT STA. 13+04 - L-.

PROJECT NO. 17BP.3.R.81
BRUNSWICK COUNTY
 STATION: 14+60.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER
 MULLBERRY BRANCH ON SR 1357
 BETWEEN NC 130 & US 17

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

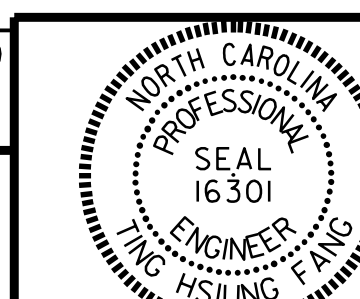
SHEET NO.

S-03

TOTAL SHEETS
14

DOCUMENT NOT CONSIDERED
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CDM Smith
 CDM SMITH
 5400 Glenwood Avenue, Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255



DRAWN BY: VDK DATE: 10/18
 CHECKED BY: THF DATE: 10/18
 DESIGN ENGINEER: VDK DATE: 11/18

DWG. No.

LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR PRESTRESSED CONCRETE CORED SLABS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.006	--	1.75	0.273	1.03	70'	EL	34.5	0.507	1.32	70'	EL	6.9	0.80	0.273	1.01	70'	EL	34.5		
	HL-93(Oper)	N/A	--	1.341	--	1.35	0.273	1.34	70'	EL	34.5	0.507	1.72	70'	EL	6.9	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.306	47.020	1.75	0.273	1.34	70'	EL	34.5	0.507	1.65	70'	EL	6.9	0.80	0.273	1.31	70'	EL	34.5		
	HS-20(Oper)	36.000	--	1.740	62.640	1.35	0.273	1.74	70'	EL	34.5	0.507	2.14	70'	EL	6.9	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.917	39.379	1.4	0.273	3.75	70'	EL	34.5	0.507	4.87	70'	EL	6.9	0.80	0.273	2.92	70'	EL	34.5	
		SNGARBS2	20.000	--	2.187	43.741	1.4	0.273	2.81	70'	EL	34.5	0.507	3.47	70'	EL	6.9	0.80	0.273	2.19	70'	EL	34.5	
		SNAGRIS2	22.000	--	2.077	45.690	1.4	0.273	2.67	70'	EL	34.5	0.507	3.23	70'	EL	6.9	0.80	0.273	2.08	70'	EL	34.5	
		SNCOTTS3	27.250	--	1.452	39.565	1.4	0.273	1.87	70'	EL	34.5	0.507	2.43	70'	EL	6.9	0.80	0.273	1.45	70'	EL	34.5	
		SNAGGRS4	34.925	--	1.218	42.554	1.4	0.273	1.57	70'	EL	34.5	0.507	2.03	70'	EL	6.9	0.80	0.273	1.22	70'	EL	34.5	
		SNS5A	35.550	--	1.191	42.346	1.4	0.273	1.53	70'	EL	34.5	0.507	2.06	70'	EL	6.9	0.80	0.273	1.19	70'	EL	34.5	
		SNS6A	39.950	--	1.095	43.747	1.4	0.273	1.41	70'	EL	34.5	0.507	1.88	70'	EL	6.9	0.80	0.273	1.10	70'	EL	34.5	
	TTST	TNAGRIT3	33.000	--	1.336	44.087	1.4	0.273	1.72	70'	EL	34.5	0.507	2.23	70'	EL	6.9	0.80	0.273	1.34	70'	EL	34.5	
		TNT4A	33.075	--	1.342	44.401	1.4	0.273	1.72	70'	EL	34.5	0.507	2.17	70'	EL	6.9	0.80	0.273	1.34	70'	EL	34.5	
		TNT6A	41.600	--	1.100	45.746	1.4	0.273	1.41	70'	EL	34.5	0.507	1.98	70'	EL	6.9	0.80	0.273	1.10	70'	EL	34.5	
		TNT7A	42.000	--	1.106	46.462	1.4	0.273	1.42	70'	EL	34.5	0.507	1.94	70'	EL	6.9	0.80	0.273	1.11	70'	EL	34.5	
		TNT7B	42.000	--	1.147	48.180	1.4	0.273	1.47	70'	EL	34.5	0.507	1.80	70'	EL	6.9	0.80	0.273	1.15	70'	EL	34.5	
		TNAGRIT4	43.000	--	1.089	46.838	1.4	0.273	1.40	70'	EL	34.5	0.507	1.74	70'	EL	6.9	0.80	0.273	1.09	70'	EL	34.5	
		TNAGT5A	45.000	--	1.026	46.175	1.4	0.273	1.32	70'	EL	34.5	0.507	1.74	70'	EL	6.9	0.80	0.273	1.03	70'	EL	34.5	
TNAGT5B	45.000	3	1.013	45.579	1.4	0.273	1.30	70'	EL	34.5	0.507	1.66	70'	EL	6.9	0.80	0.273	1.01	70'	EL	34.5			

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

- 1.
- 2.
- 3.
- 4.

CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

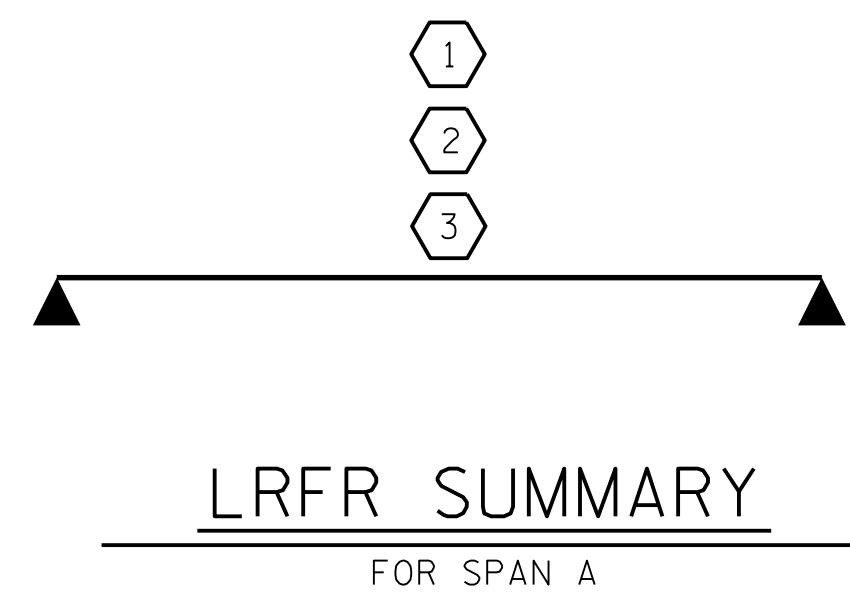
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER



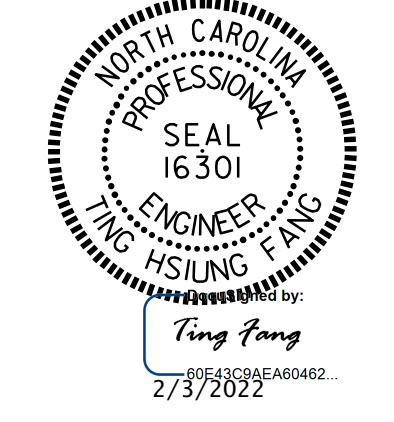
PROJECT NO. 17BP.3.R.81
BRUNSWICK COUNTY
 STATION: 14+60.00 -L-

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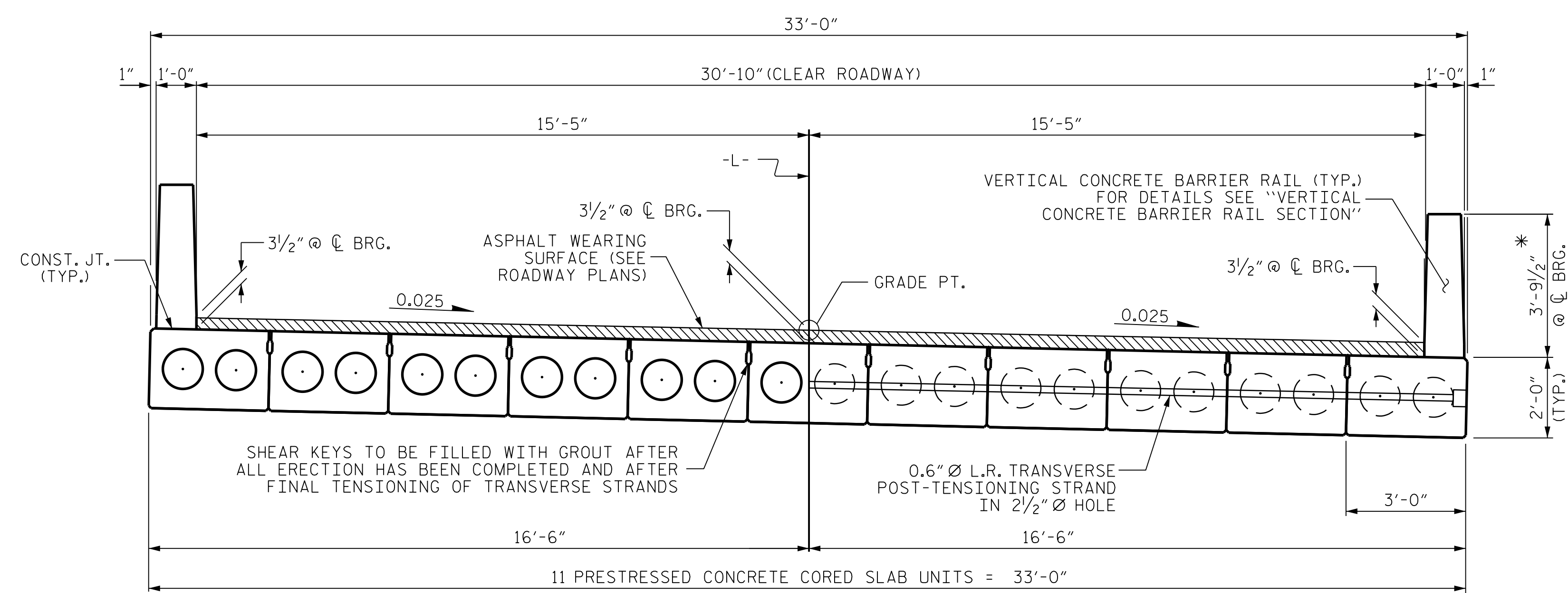
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**LRFR SUMMARY FOR
 70' CORED SLAB UNIT
 90° SKEW
 SPAN A
 (NON-INTERSTATE TRAFFIC)**

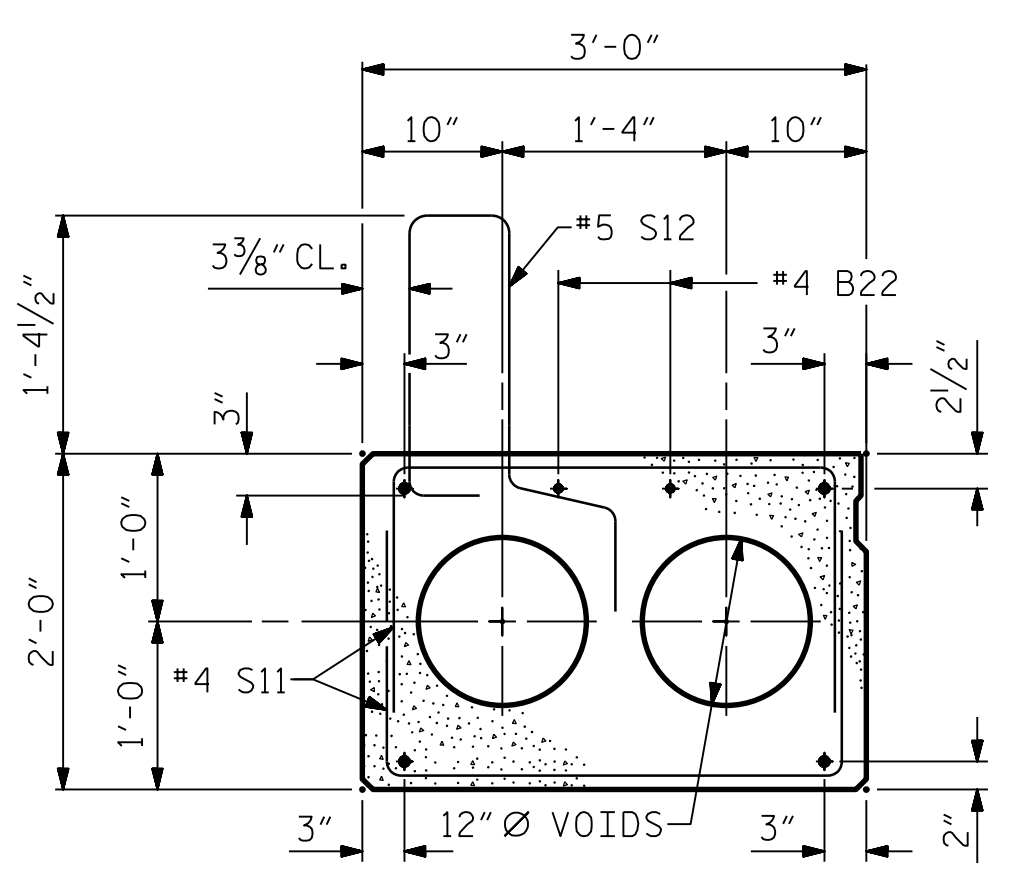
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-04
1			3			TOTAL SHEETS
2			4			14



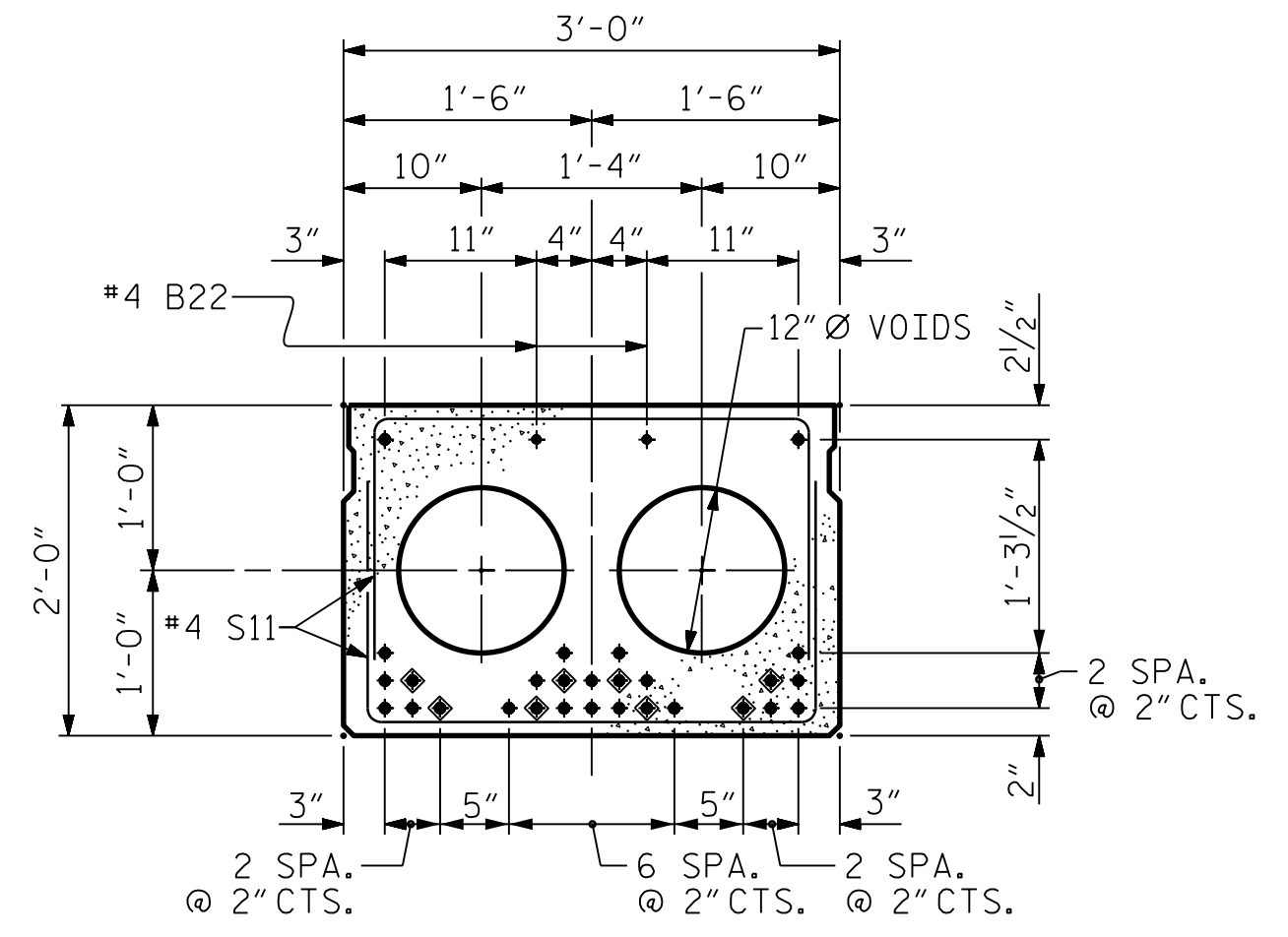
HALF SECTION THROUGH VOIDS **HALF SECTION AT INTERMEDIATE DIAPHRAGMS**

TYPICAL SECTION

* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN, THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.



EXTERIOR SLAB SECTION
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)

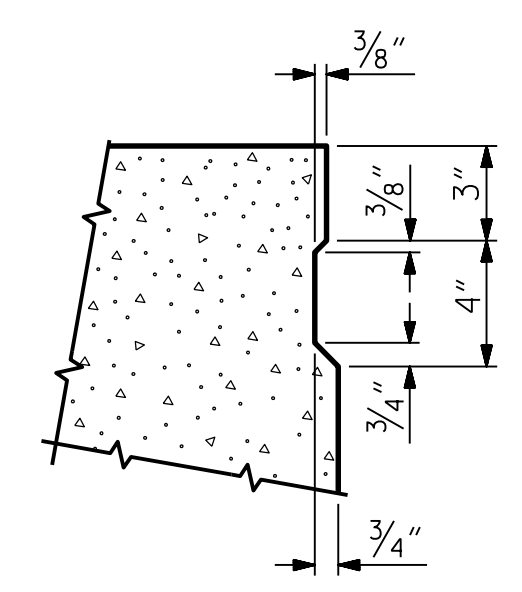


INTERIOR SLAB SECTION
(28 STRANDS REQUIRED)

0.6" Ø LOW RELAXATION STRAND LAYOUT

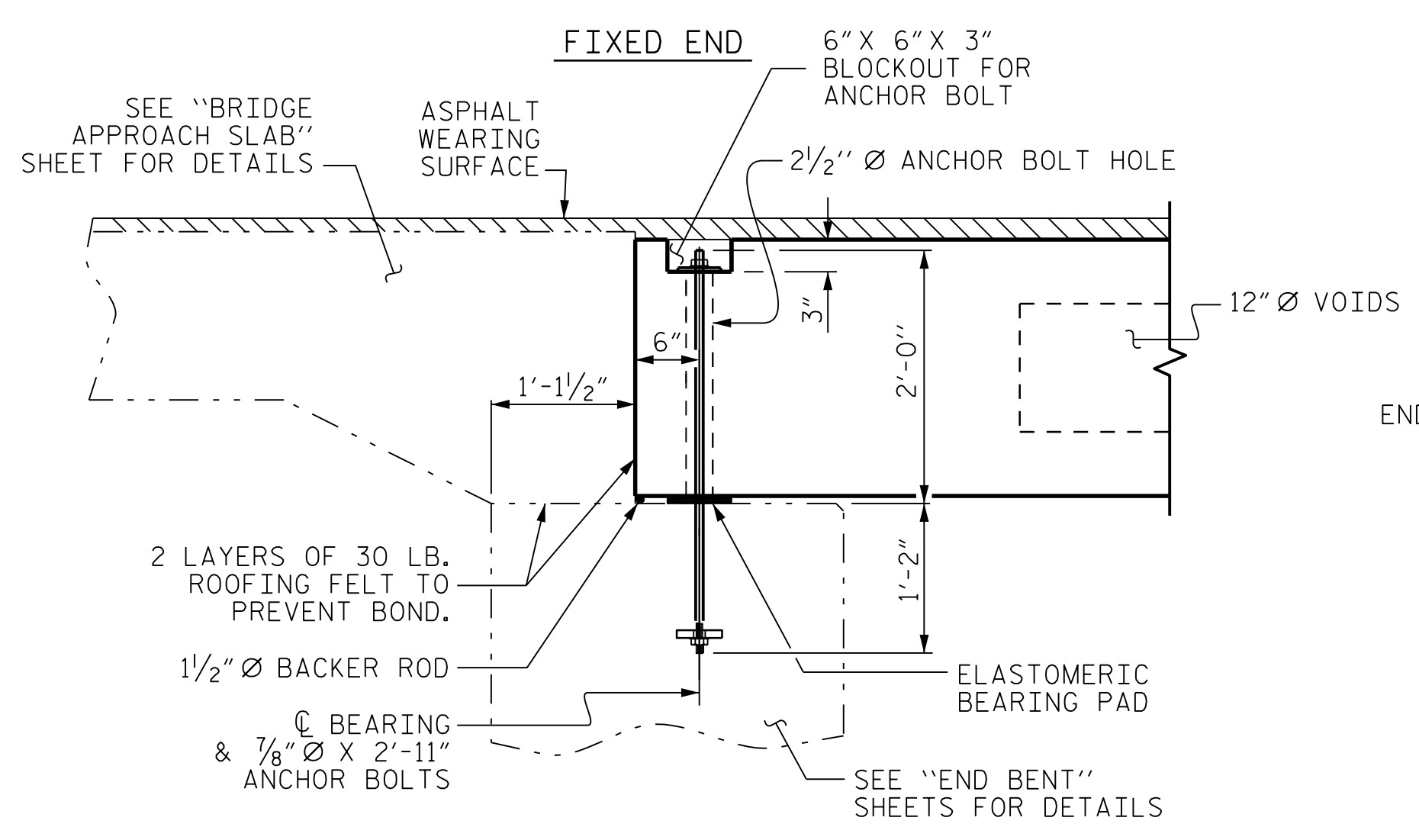
◆ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 12'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND

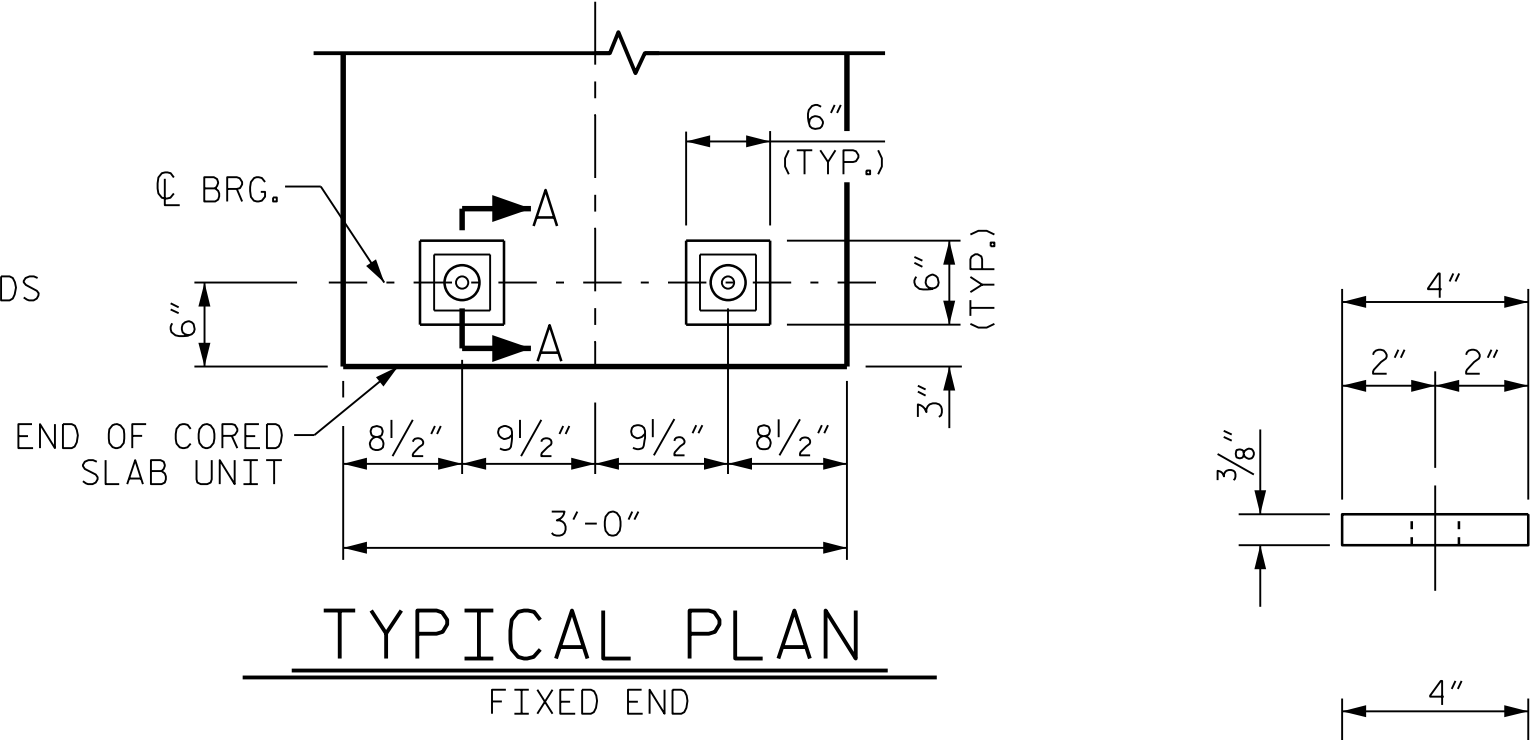


SHEAR KEY DETAIL

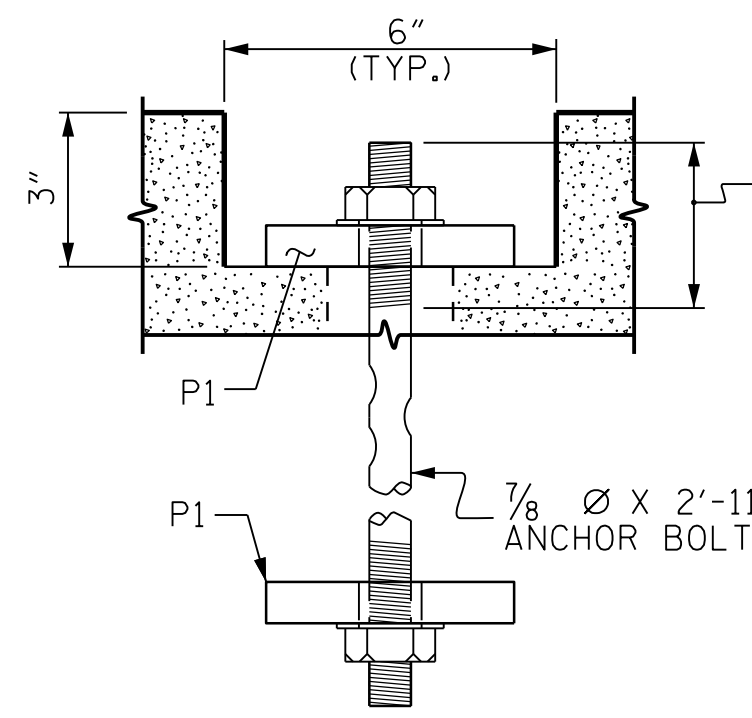
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.



SECTION AT END BENT



TYPICAL PLAN



SECTION A-A (FIXED)

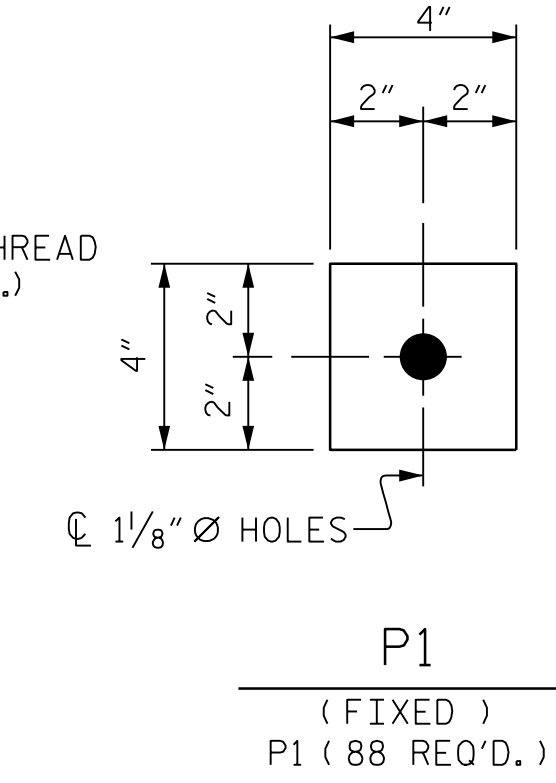
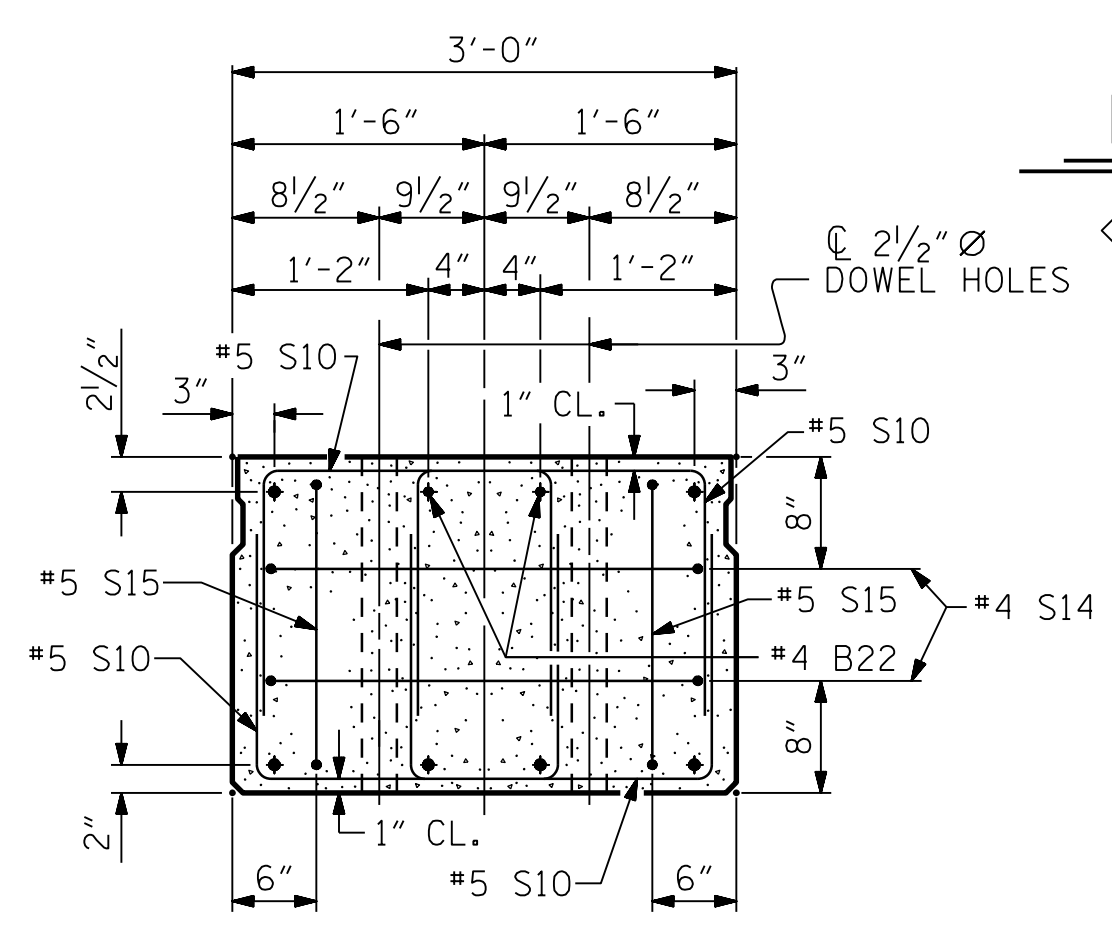


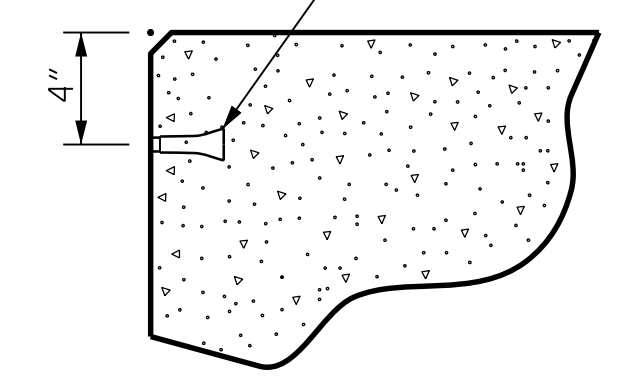
PLATE DETAILS



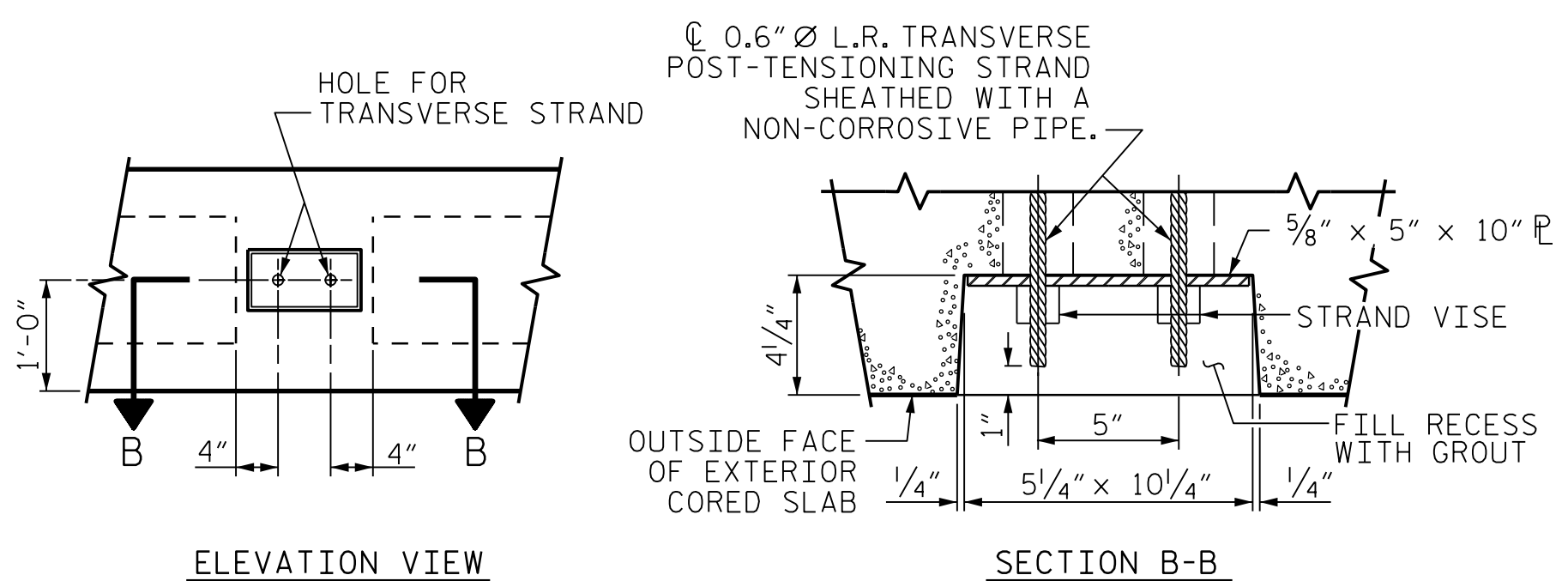
END ELEVATION

SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.

PERMITTED THREADED INSERT CAST IN OUTSIDE FACE OF EXTERIOR UNIT AND RECESSED 3/8" SIZE TO BE DETERMINED BY CONTRACTOR.



THREADED INSERT DETAIL



ELEVATION VIEW

SECTION B-B

GRAUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLABS

BLOCKOUT DETAIL FOR ANCHOR BOLTS

FOR ANCHOR BOLT AND BLOCKOUT NOTES, SEE SHEET S-06.

PROJECT NO. **17BP.3.R.81**
BRUNSWICK COUNTY
STATION: **14+60.00 -L-**

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB UNIT
90° SKEW SPAN A

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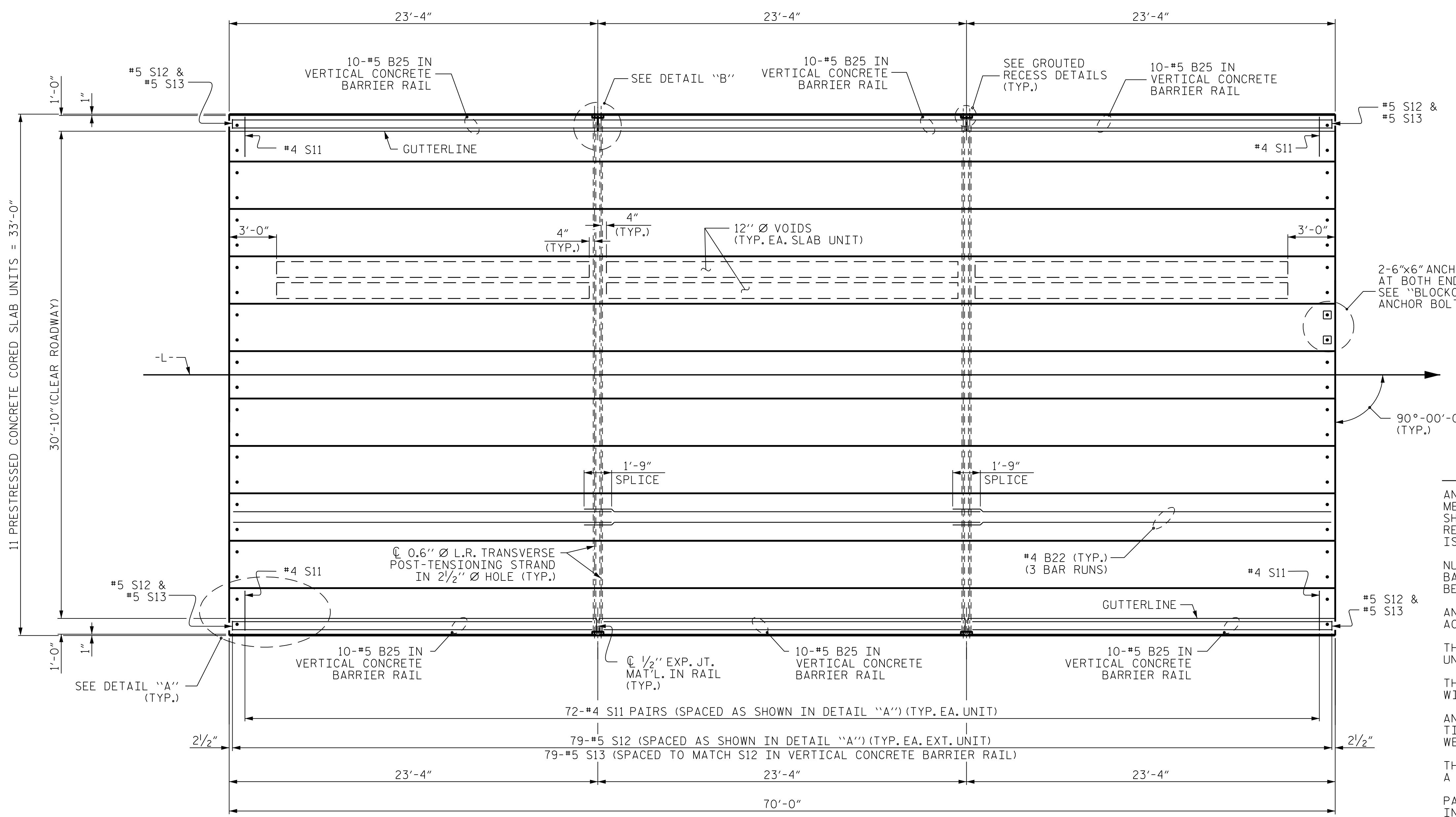
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NORTH CAROLINA PROFESSIONAL SEAL 16301
ENGINEER
TING FANG

REVISIONS				SHEET NO.	
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1			3		
2			4		

TOTAL SHEETS: 14



ANCHOR BOLTS NOTES

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP INSPECTION IS REQUIRED.

NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

ANCHOR BOLTS, NUTS, WASHERS AND PLATES "P1" SHALL BE GALVANIZED IN ACCORDANCE WITH STANDARD SPECIFICATIONS.

THE TWO 2 1/2" Ø ANCHOR BOLT HOLES AT BOTH ENDS OF EACH CORED SLAB UNIT SHALL BE FILLED WITH NON-SHRINK GROUT.

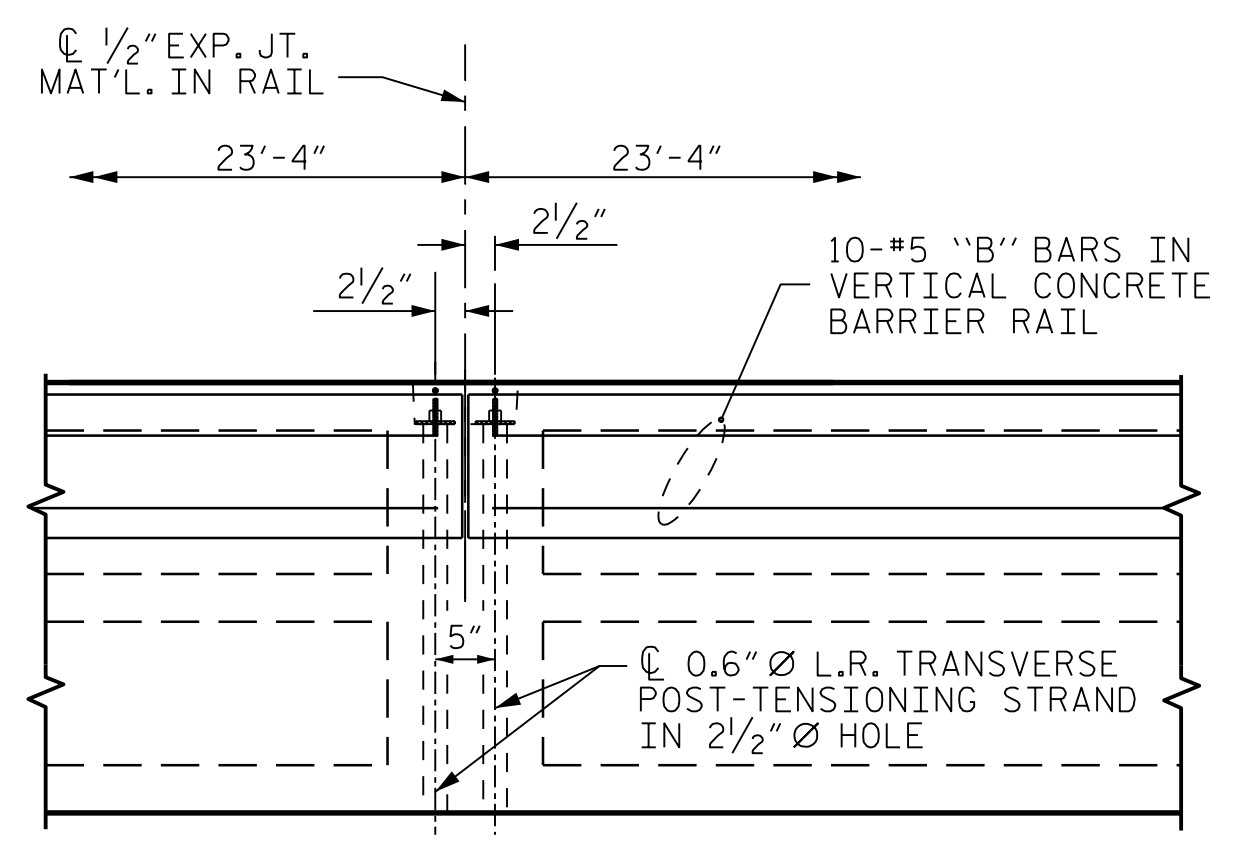
THE VERTICAL FACES OF THE ANCHOR BOLT BLOCKOUTS SHALL BE FINISHED WITH A ROUGH SURFACE.

ANCHOR BOLT BLOCKOUTS SHALL BE FILLED WITH NON-SHRINK GROUT AFTER TIGHTENING OF THE ANCHOR BOLTS AND PRIOR TO PLACEMENT OF ASPHALT WEARING SURFACE.

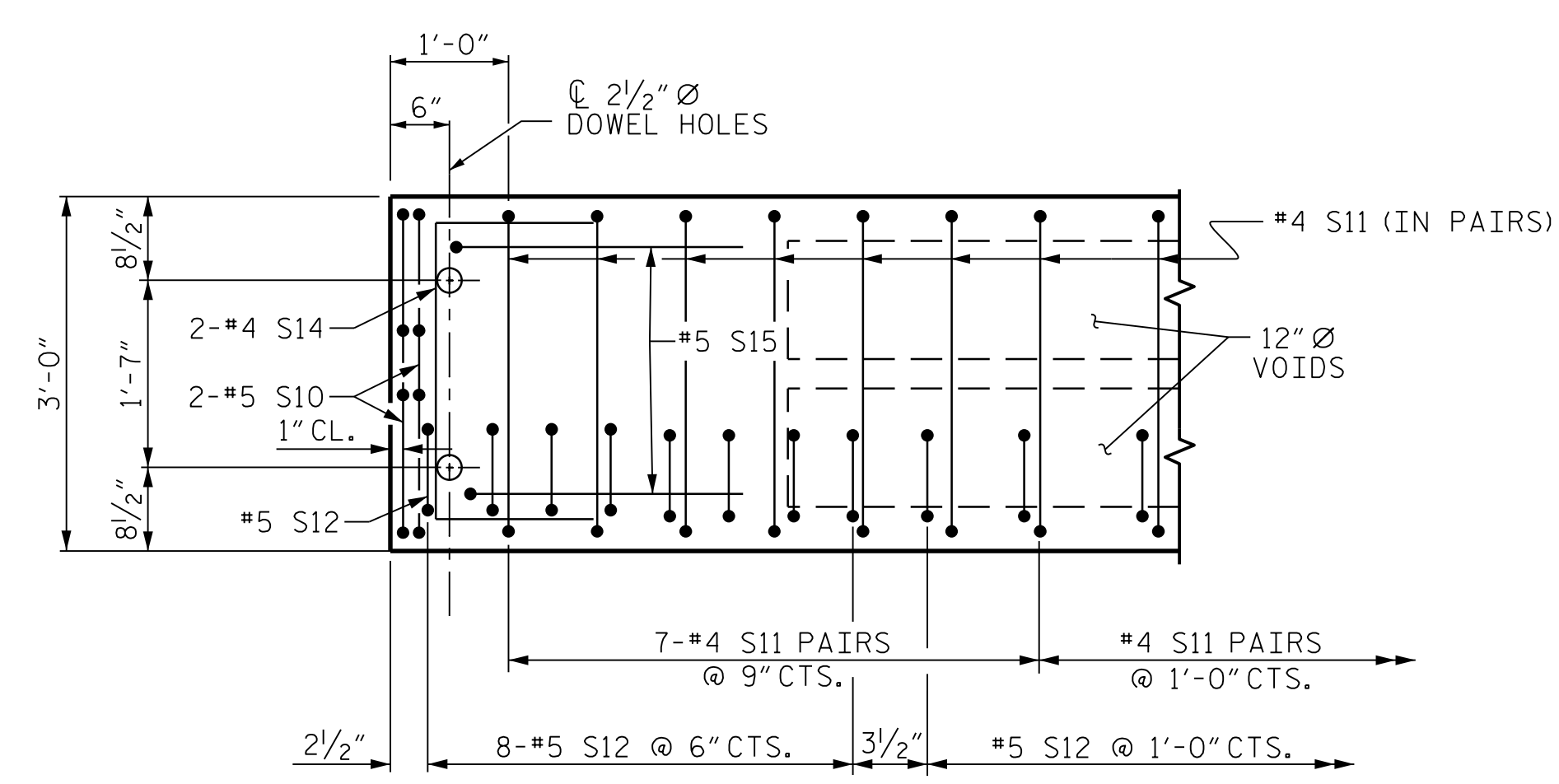
THE #4S10 AND #4S12 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN A 1" CLEARANCE TO THE ANCHOR BOLT BLOCKOUT.

PAYMENT FOR ANCHOR BOLTS, NUTS, WASHERS AND PLATES SHALL BE INCLUDED IN PRESTRESSED CONCRETE CORED SLAB UNITS PAY ITEM.

PLAN OF SPAN A



DETAIL "B"
 #4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUDED RECESS AND 2 1/2" Ø TRANSVERSE POST-TENSIONING STRAND HOLES



DETAIL "A"
 (TYPICAL EACH END OF UNIT)
 NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S12 BARS.

PROJECT NO. **17BP.3.R.81**
BRUNSWICK COUNTY
 STATION: **14+60.00 -L-**

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**PLAN OF 70' UNIT
 30'-10" CLEAR ROADWAY
 90° SKEW
 SPAN A**

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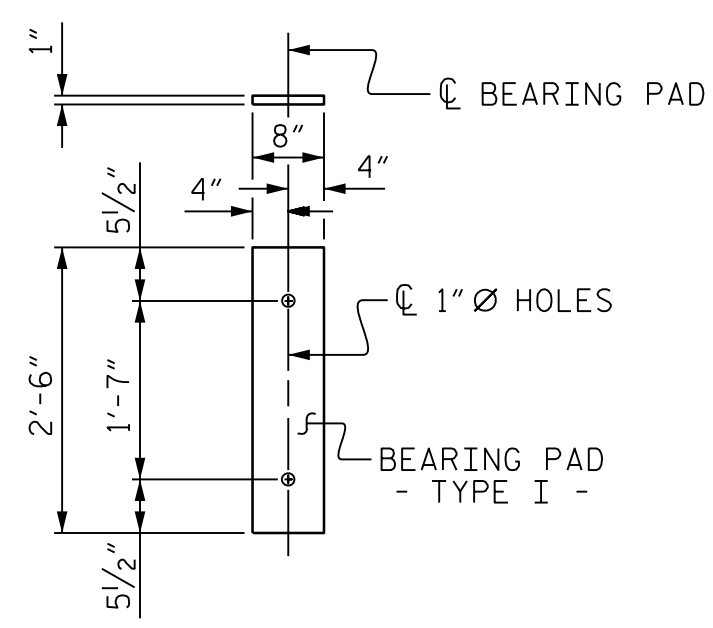
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FIXED END
(TYPE I - 22 REO'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

DEAD LOAD DEFLECTION AND CAMBER

3'-0" x 2'-0"	
70' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	2/4" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	3/4" ↓
FINAL CAMBER	1/2" ↑

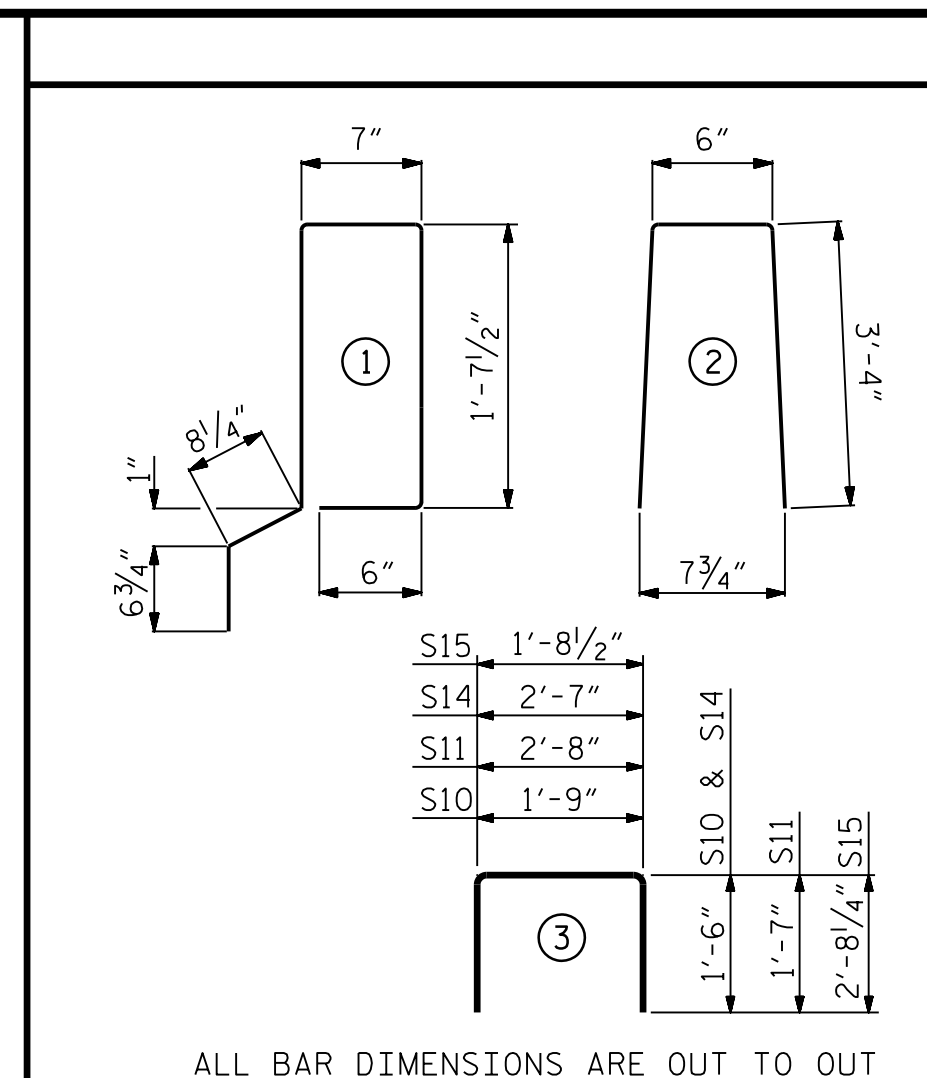
** INCLUDES FUTURE WEARING SURFACE

GRADE 270 STRANDS

0.6" Ø L.R.	
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950

BILL OF MATERIAL FOR ONE 70' CORED SLAB UNIT

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
				LENGTH	WEIGHT	LENGTH	WEIGHT
B22	6	#4	STR	24'-6"	98	24'-6"	98
S10	8	#5	3	4'-9"	40	4'-9"	40
S11	144	#4	3	5'-10"	561	5'-10"	561
*S12	79	#5	1	5'-7"	460		
S14	4	#4	3	5'-7"	15	5'-7"	15
S15	4	#5	3	7'-1"	30	7'-1"	30
REINFORCING STEEL				LBS.	744	LBS.	744
* EPOXY COATED REINFORCING STEEL				LBS.	460		
7000 P.S.I. CONCRETE				CU. YDS.	11.8	CU. YDS.	11.8
0.6" Ø L.R. STRANDS				No.	28	No.	28



NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUDED AFTER THE TENSIONING OF THE STRANDS.

THE 2/2" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

THE BACKER RODS SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN CORED SLABS ARE CAST, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN THE REQUIRED STRENGTH SHOWN IN THE "CONCRETE RELEASE STRENGTH" TABLE.

ALL REINFORCING STEEL IN VERTICAL CONCRETE BARRIER RAILS SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.

MAINTAIN A SYMMETRIC TENSION FORCE BETWEEN EACH PAIR OF TRANSVERSE POST TENSIONING STRANDS IN THE DIAPHRAGM.

THE #4 S11 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUDED RECESS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.

THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

THE PERMITTED THREADED INSERTS SHALL BE GROUDED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.

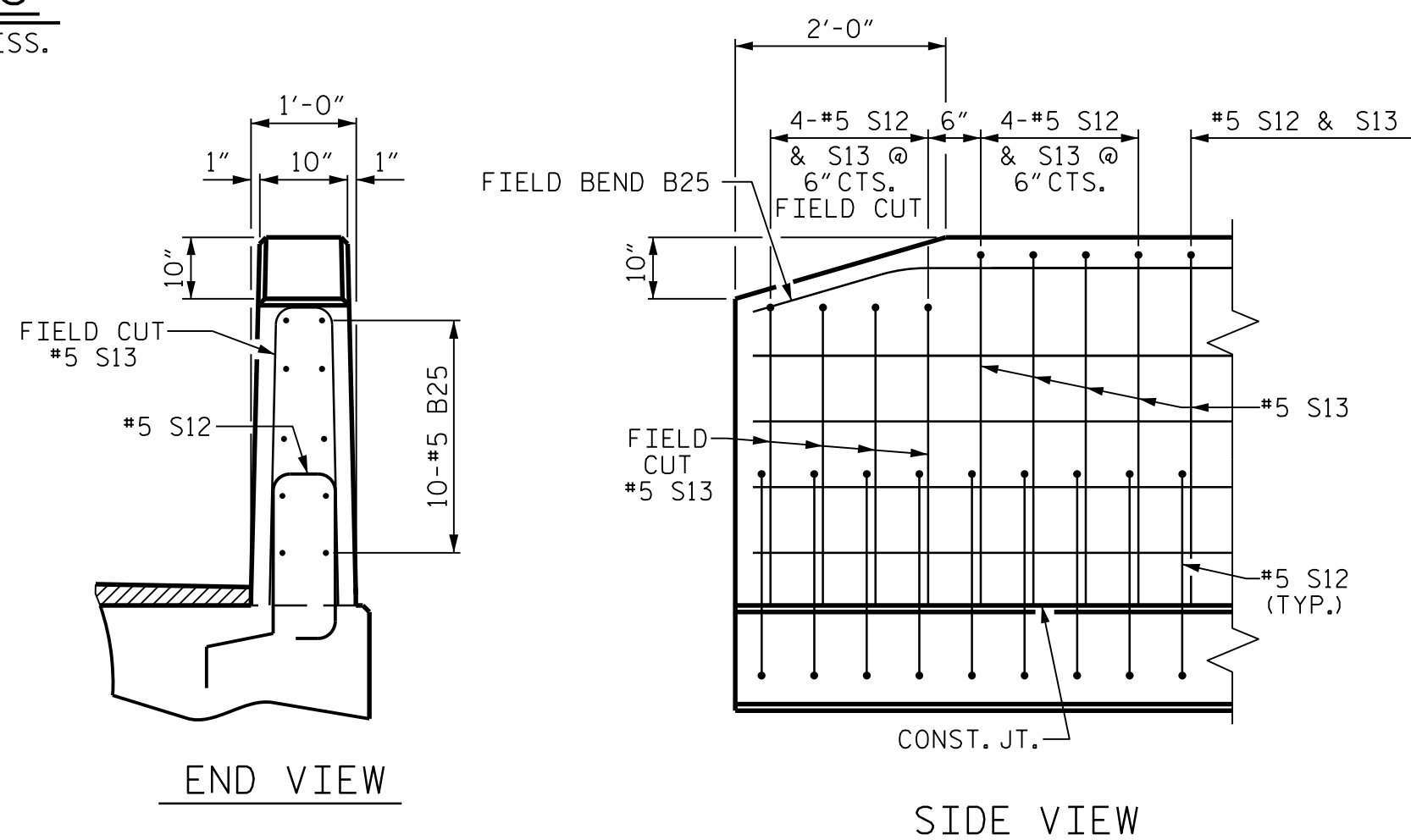
THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.

CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
70' UNIT			
EXTERIOR C.S.	2	70'-0"	140'-0"
INTERIOR C.S.	9	70'-0"	630'-0"
TOTAL			770'-0"

CONCRETE RELEASE STRENGTH

UNIT	PSI
70' UNIT	5500



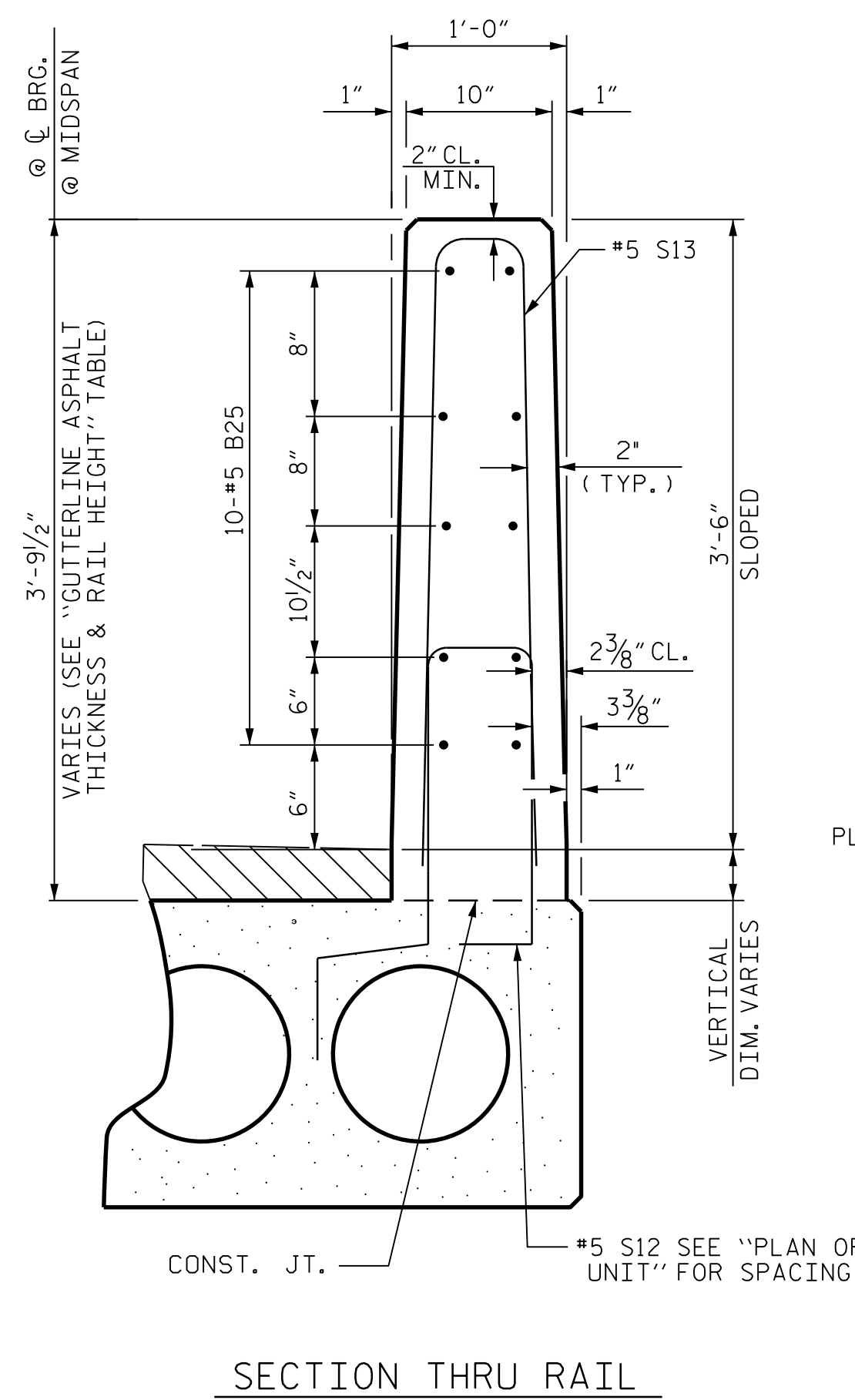
GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

	ASPHALT OVERLAY THICKNESS	RAIL HEIGHT
	@ MID-SPAN	@ MID-SPAN
70' UNIT	2"	3'-8"

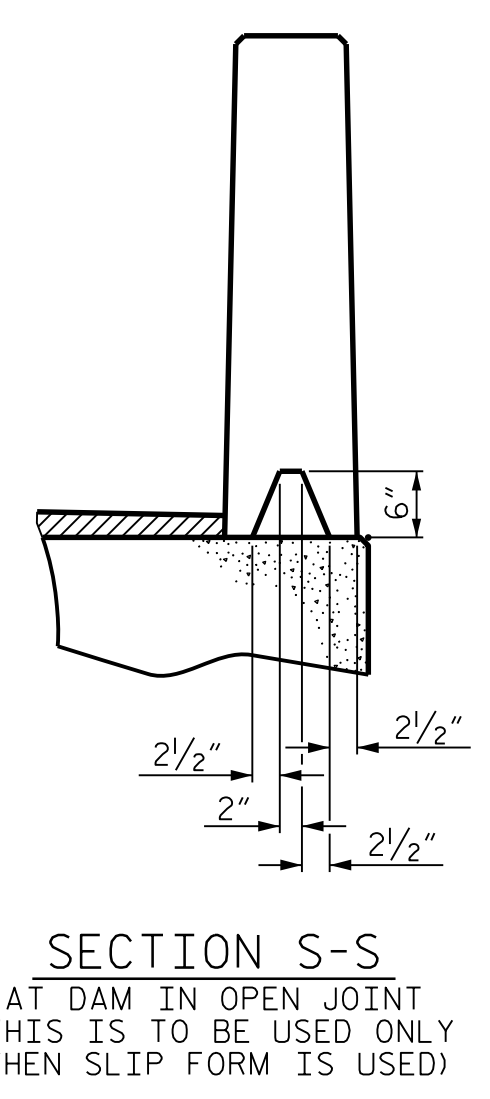
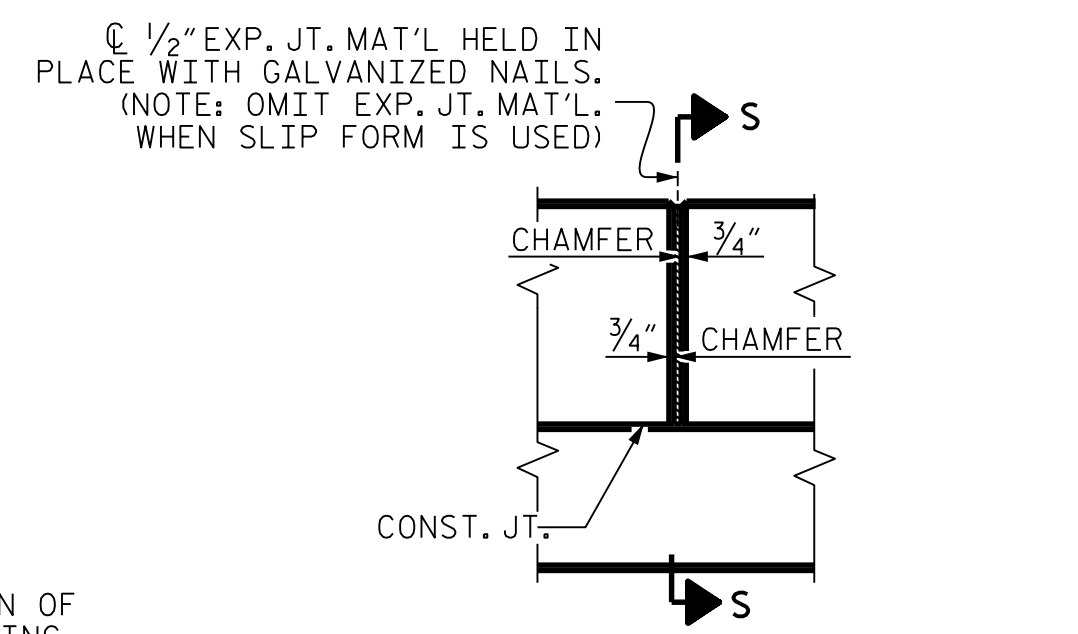
BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
70' UNIT						
*B25	60	60	#5	STR	22'-11"	1434
*S13	158	158	#5	2	7'-2"	1181
* EPOXY COATED REINFORCING STEEL					LBS.	2615
CLASS AA CONCRETE					CU. YDS.	18.1
TOTAL VERTICAL CONCRETE BARRIER RAIL					LN. FT.	140.0

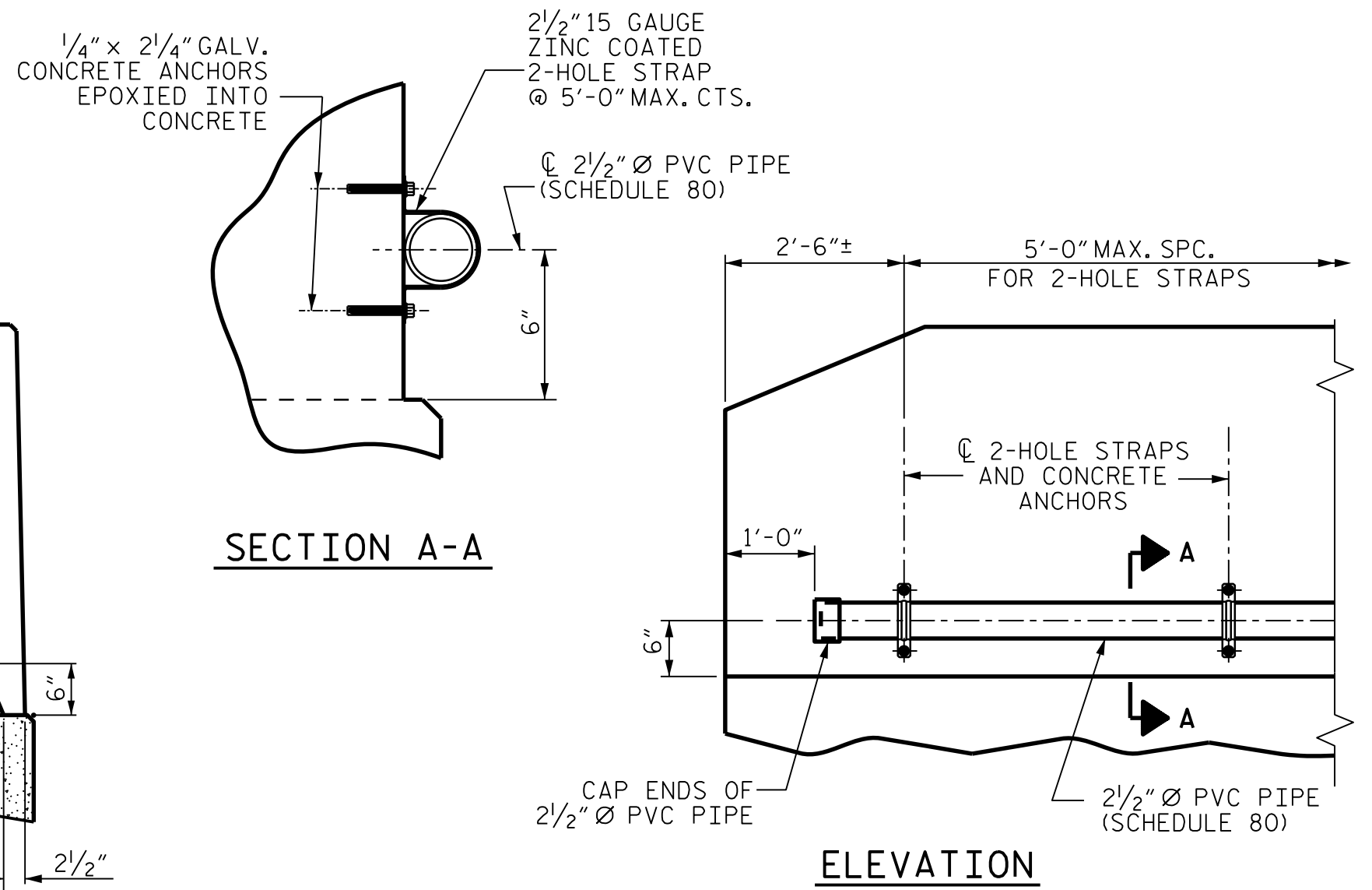
TOTAL LENGTH OF FIBER OPTIC CONDUIT SYSTEM FOR ENTIRE BRIDGE: 136.0 LN. FT.
NOTE: FOR FIBER OPTIC CONDUIT SYSTEM, SEE SPECIAL PROVISIONS.



END OF RAIL DETAILS



VERTICAL CONCRETE BARRIER RAIL SECTION



FIBER OPTIC CONDUIT SYSTEM DETAILS

2/2" Ø SCHEDULE 80 PVC PIPE ATTACHED TO THE BACK OF BOTH RAILS FOR FUTURE FIBER OPTIC CABLE.

PROJECT NO. 17BP.3.R.81
BRUNSWICK COUNTY
STATION: 14+60.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB UNIT 90 ° SKEW

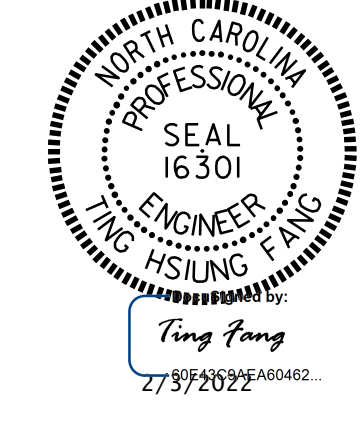
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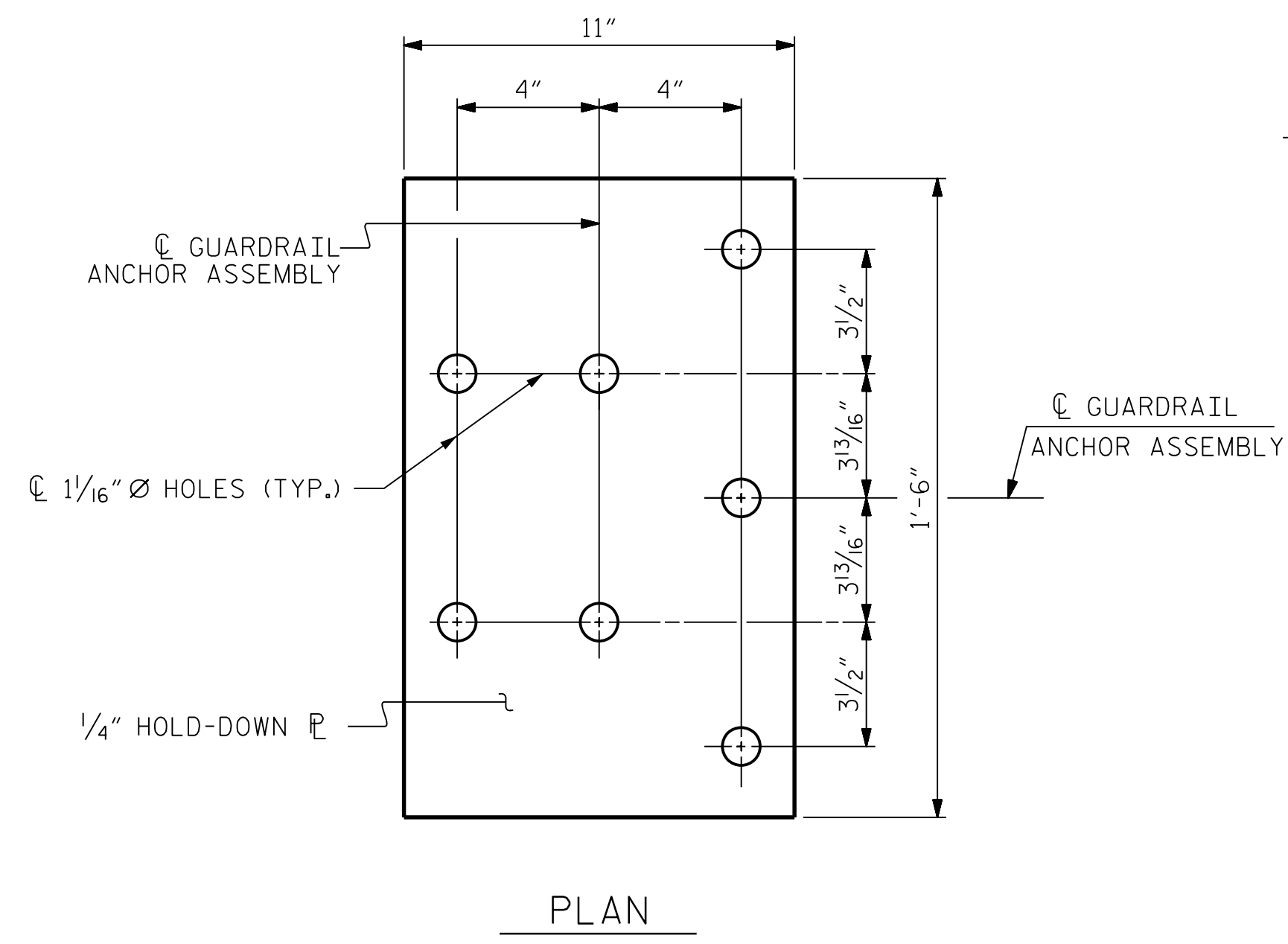
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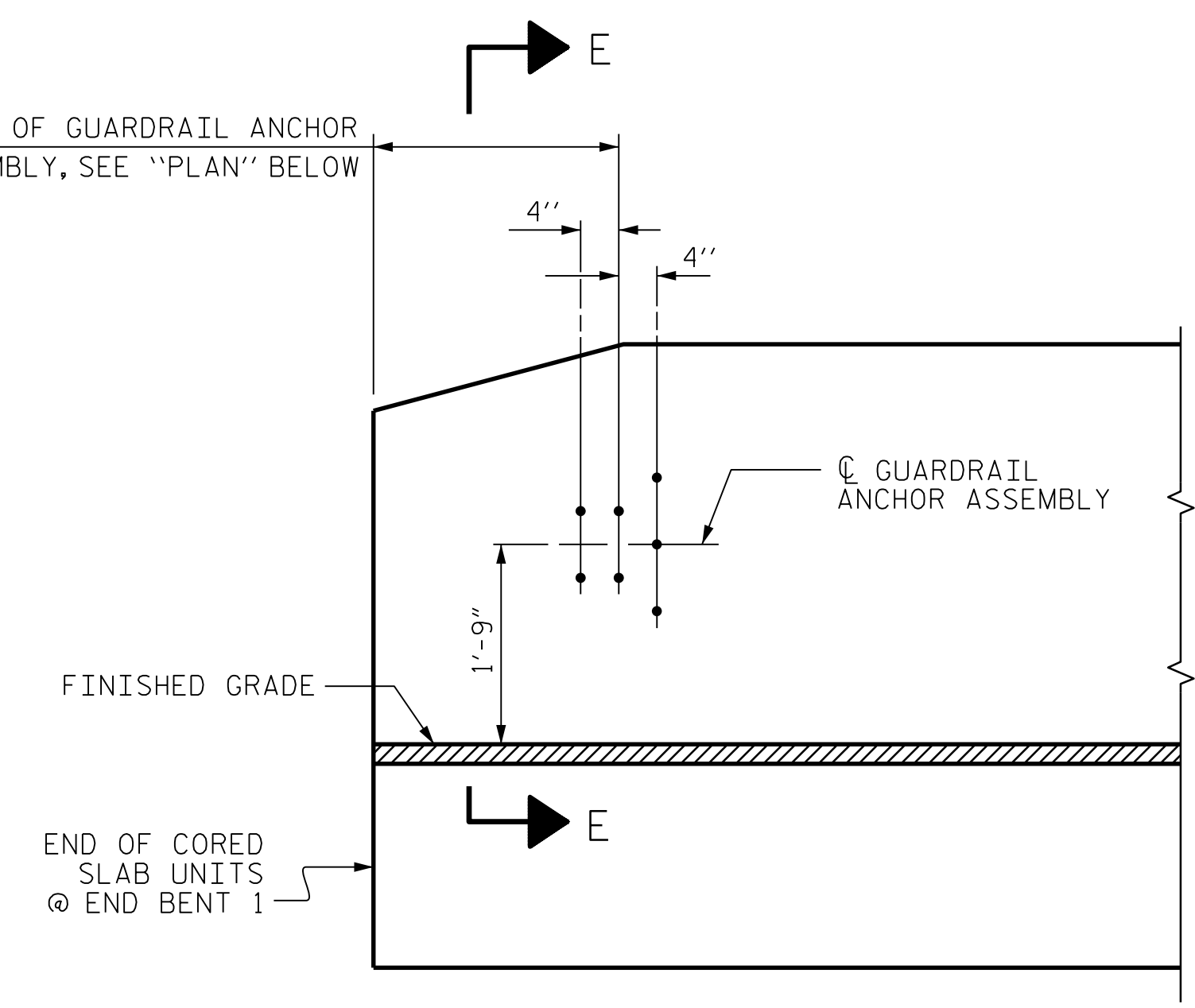
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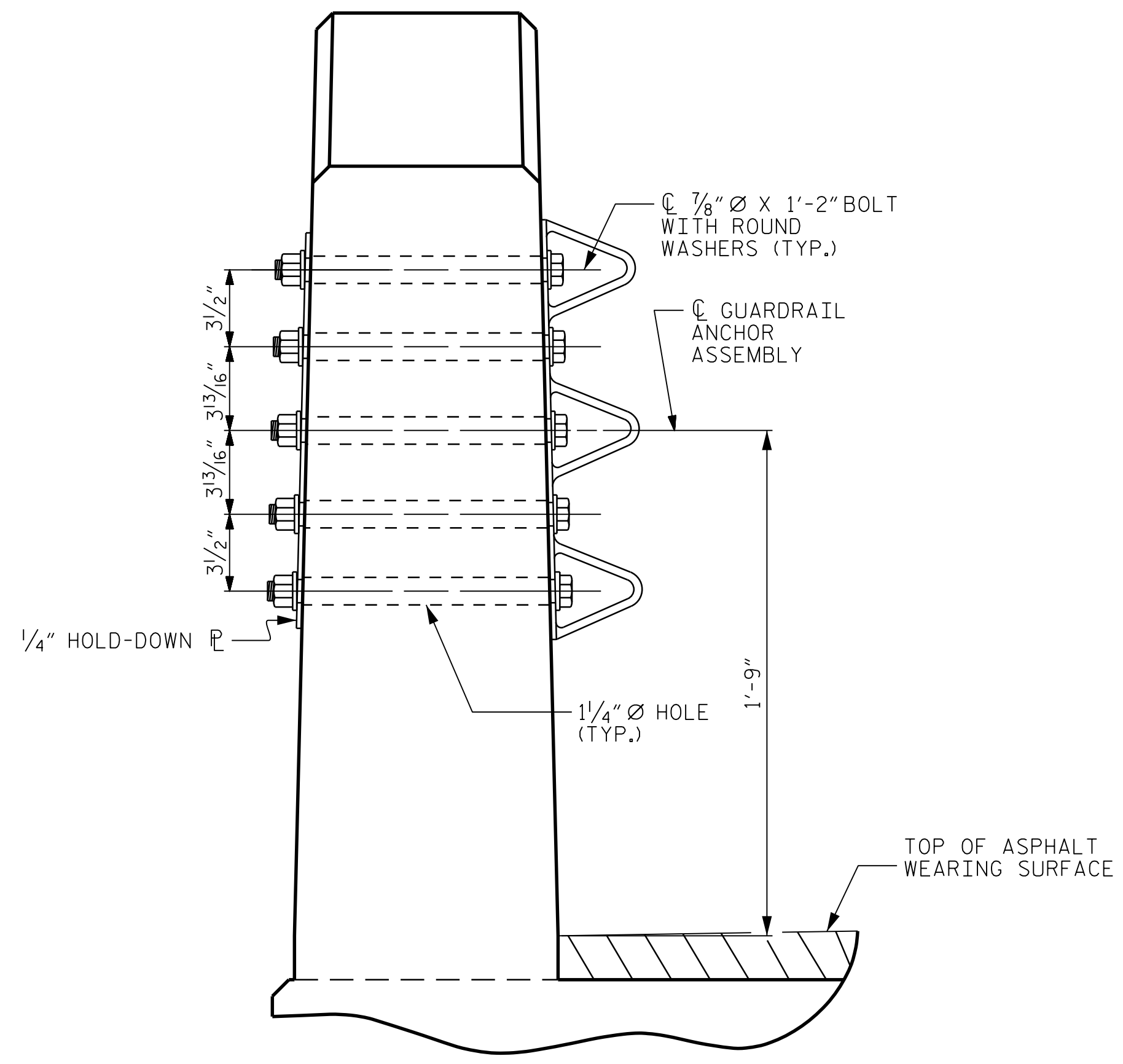


PLAN

FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLY, SEE "PLAN" BELOW

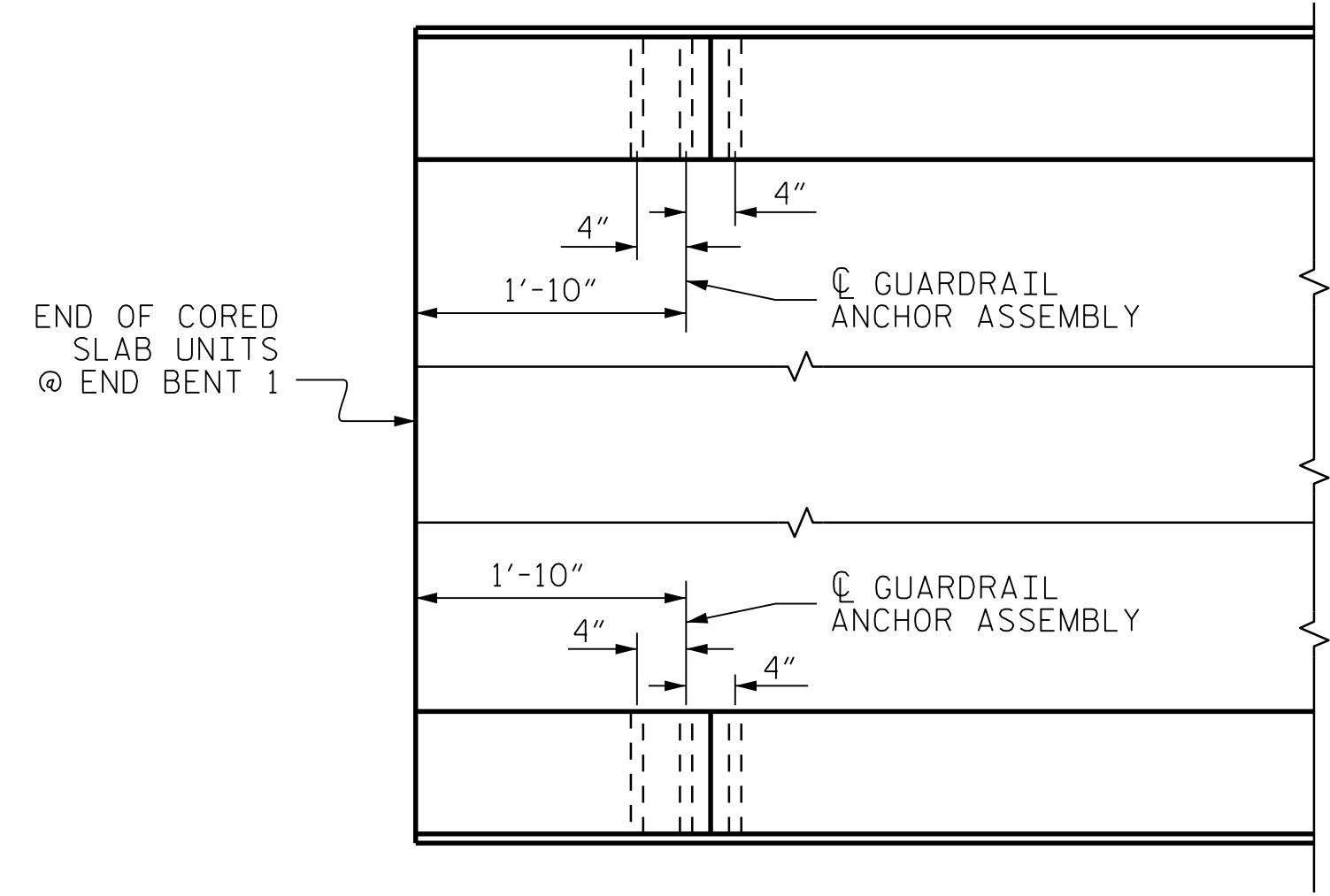


ELEVATION



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR.

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 7/8" Ø BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



SKETCH SHOWING POINTS OF ATTACHMENT

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. 17BP.3.R.81
BRUNSWICK COUNTY
 STATION: 14+60.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 STANDARD GUARDRAIL
 ANCHORAGE FOR
 VERTICAL CONCRETE
 BARRIER RAIL

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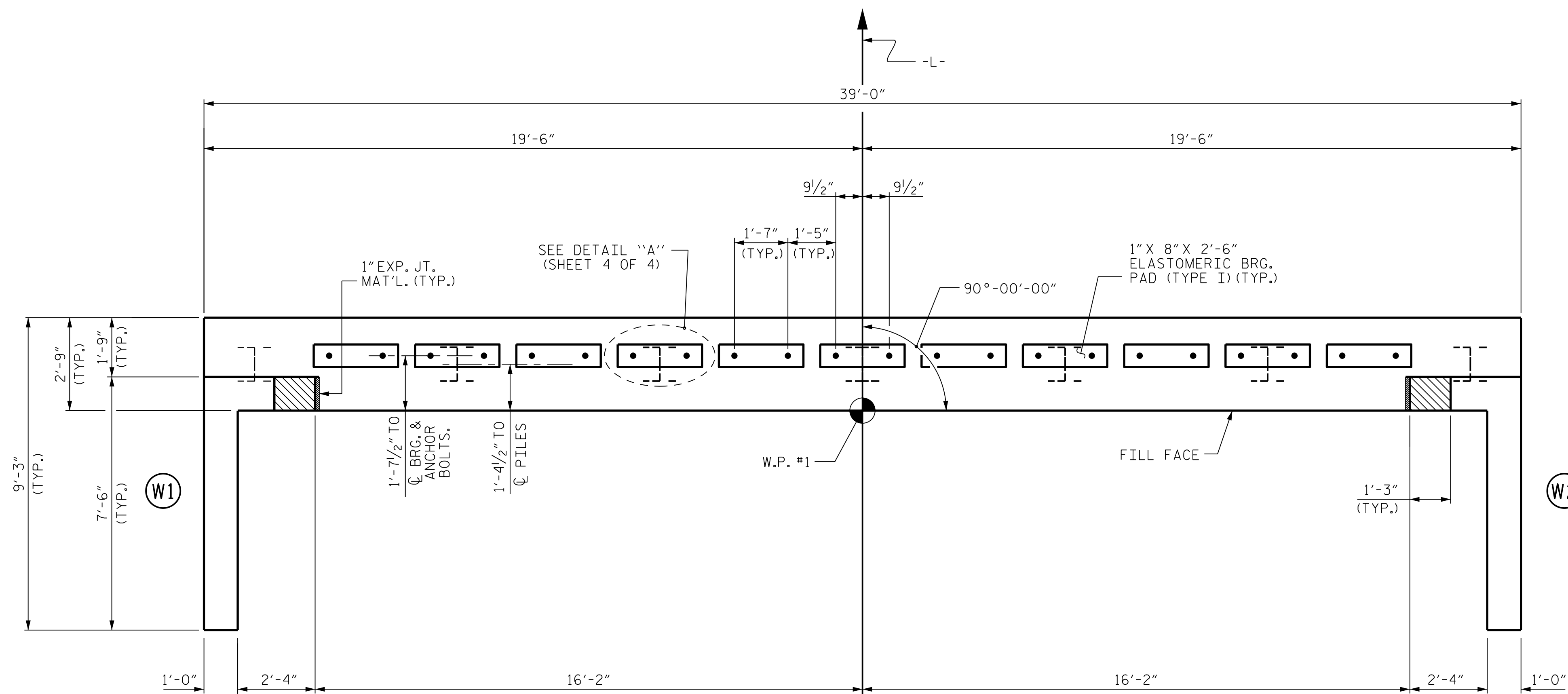
NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

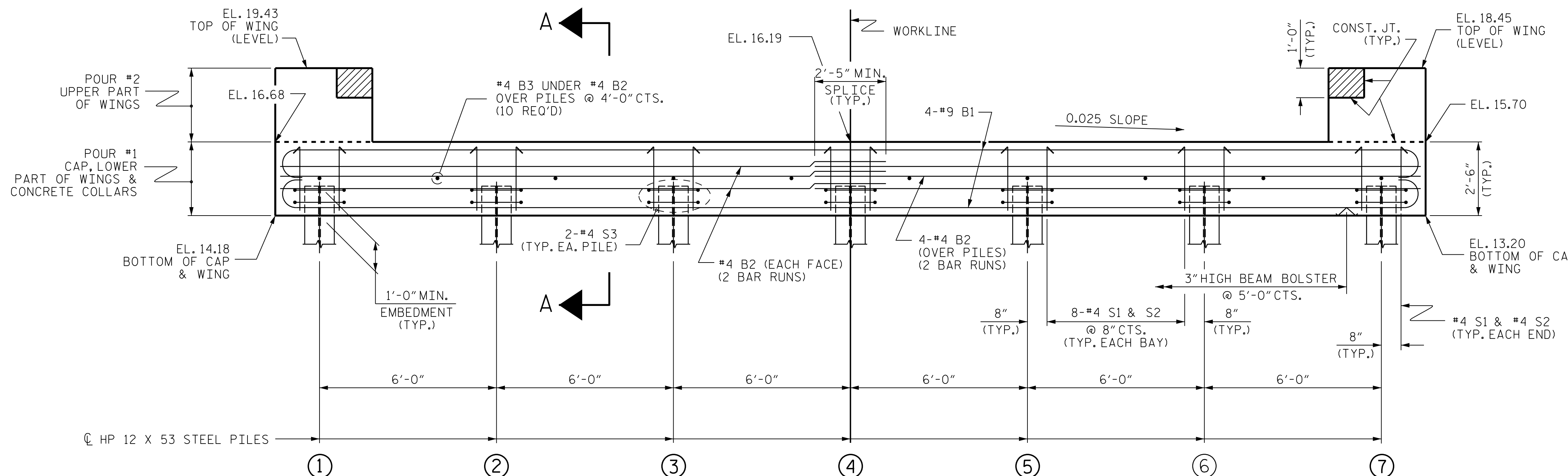
FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN

TOP OF PILE ELEVATIONS

①	15.13
②	14.98
③	14.83
④	14.68
⑤	14.53
⑥	14.38
⑦	14.23



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

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STATION: 14+60.00 -L-

SHEET 1 OF 4

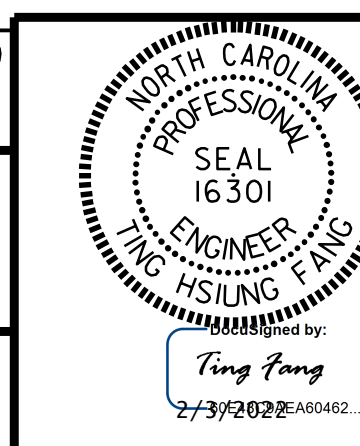
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT 1

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NC COA No. F-1255

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CHECKED BY: THF DATE: 10/18
DESIGN ENGINEER: VDK DATE: 11/18

DWG. No.



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-09
1			3			TOTAL SHEETS
2			4			14

NOTES

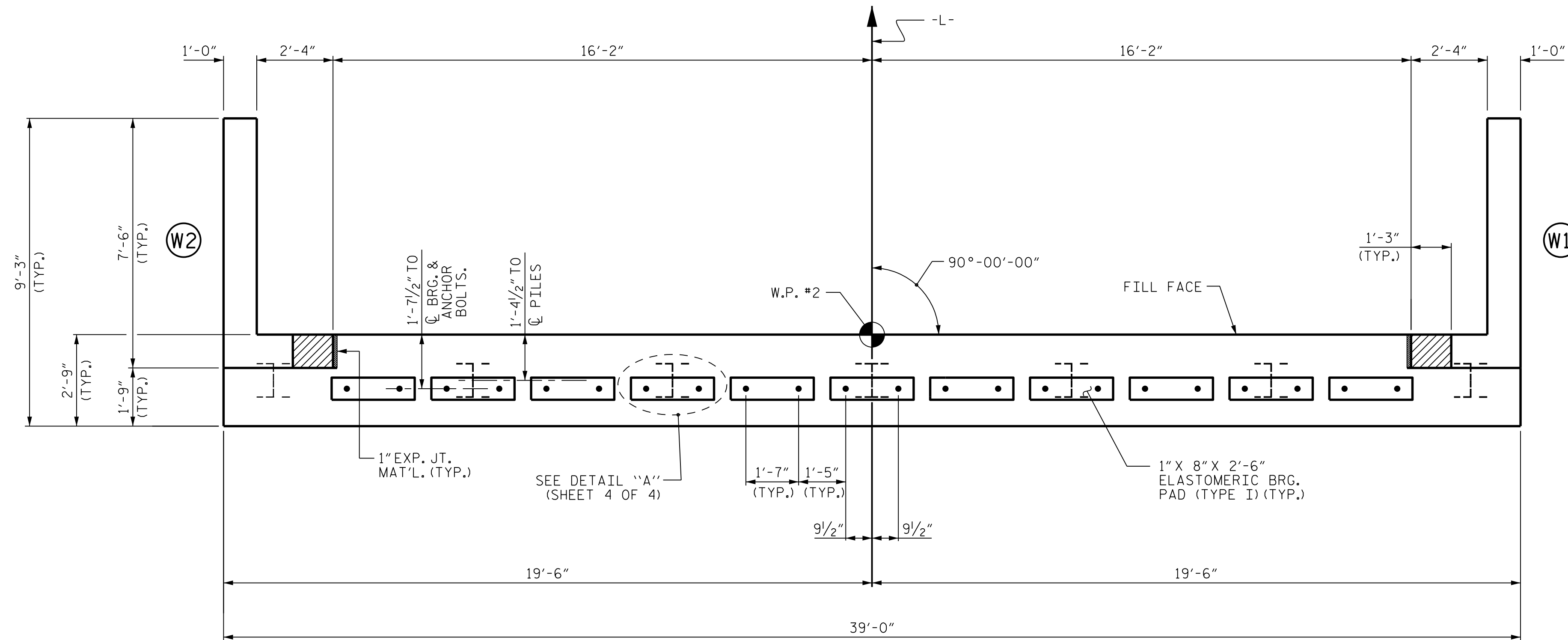
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

GALVANIZED THE TOP 20 FEET OF EACH END BENT PILE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

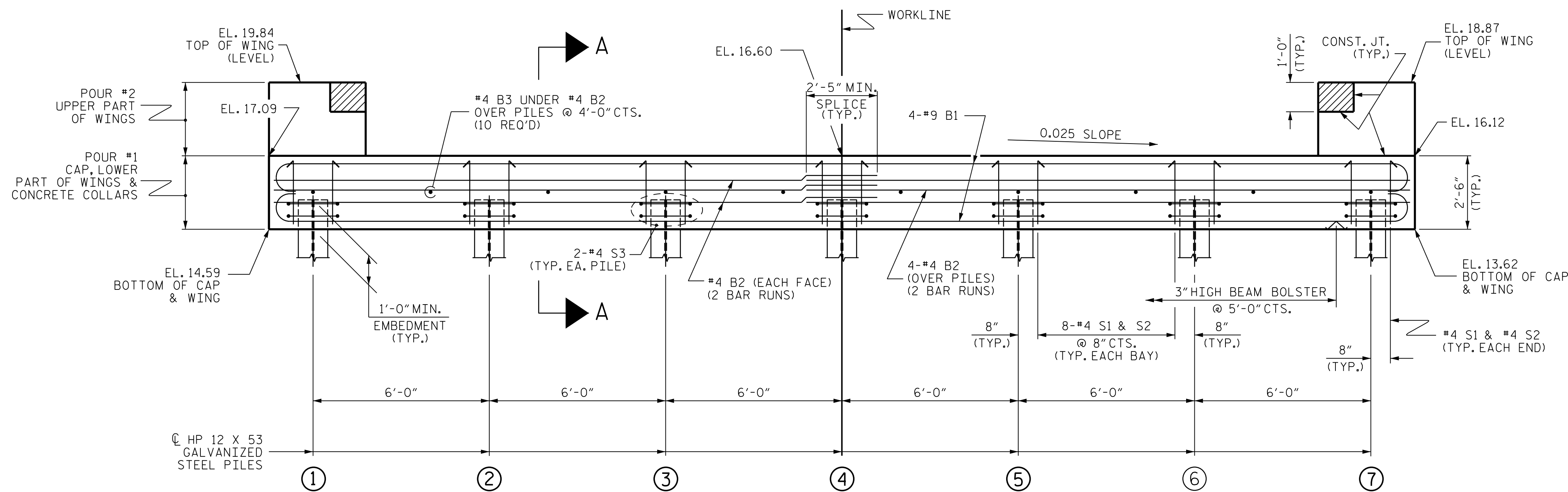
FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN

TOP OF PILE ELEVATIONS	
①	15.54
②	15.39
③	15.24
④	15.09
⑤	14.94
⑥	14.79
⑦	14.64



ELEVATION

WINGS NOT SHOWN FOR CLARITY. FOR SECTION A-A, SEE SHEET 4 OF 4. CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

PROJECT NO. 17BP.3.R.81
BRUNSWICK COUNTY
STATION: 14+60.00 -L-

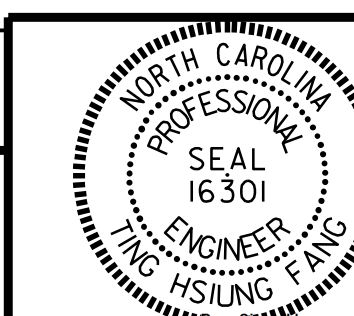
SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 2

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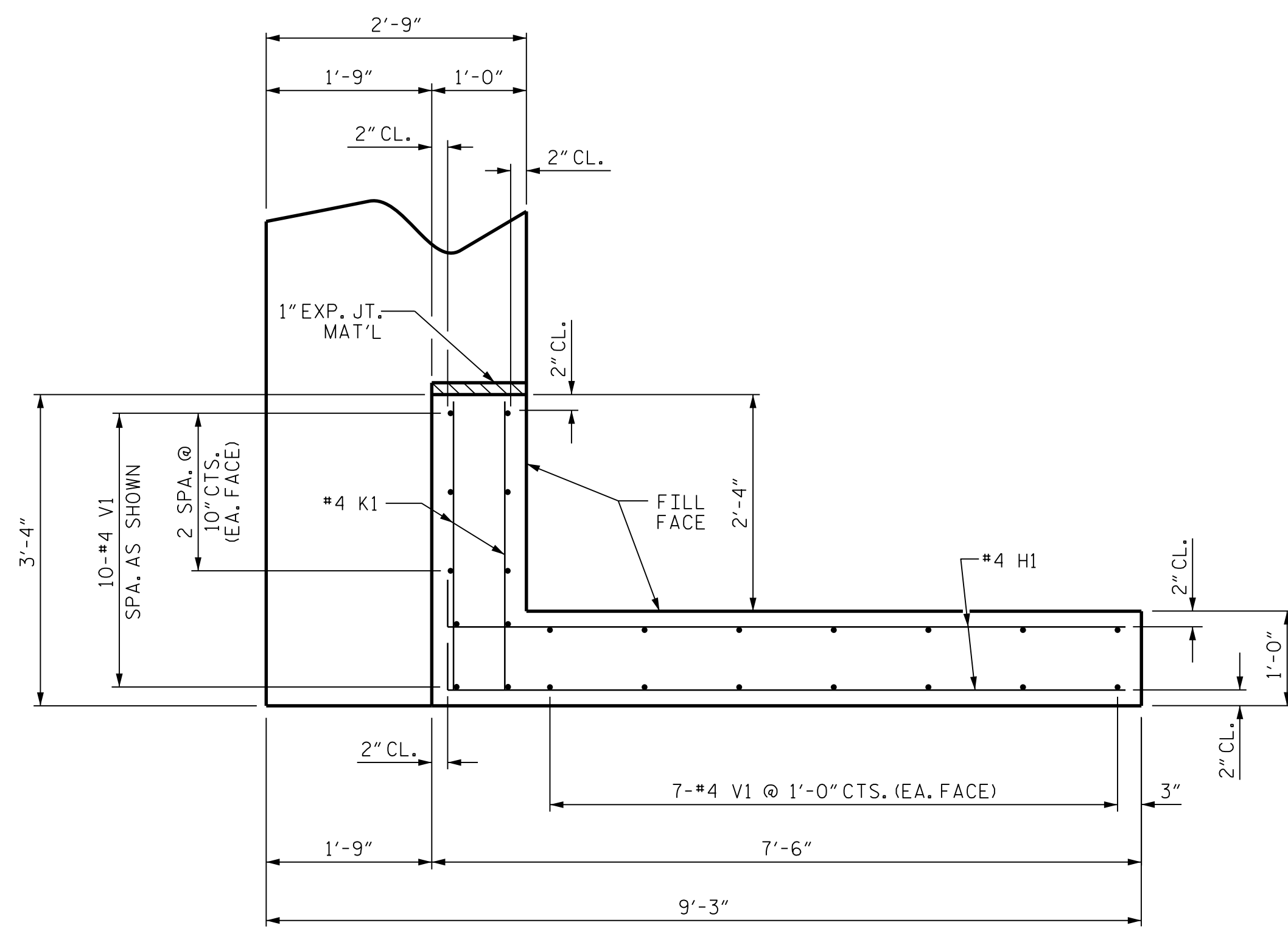
DRAWN BY: VDK DATE: 10/18
CHECKED BY: THF DATE: 10/18
DESIGN ENGINEER: VDK DATE: 11/18

DWG. No.

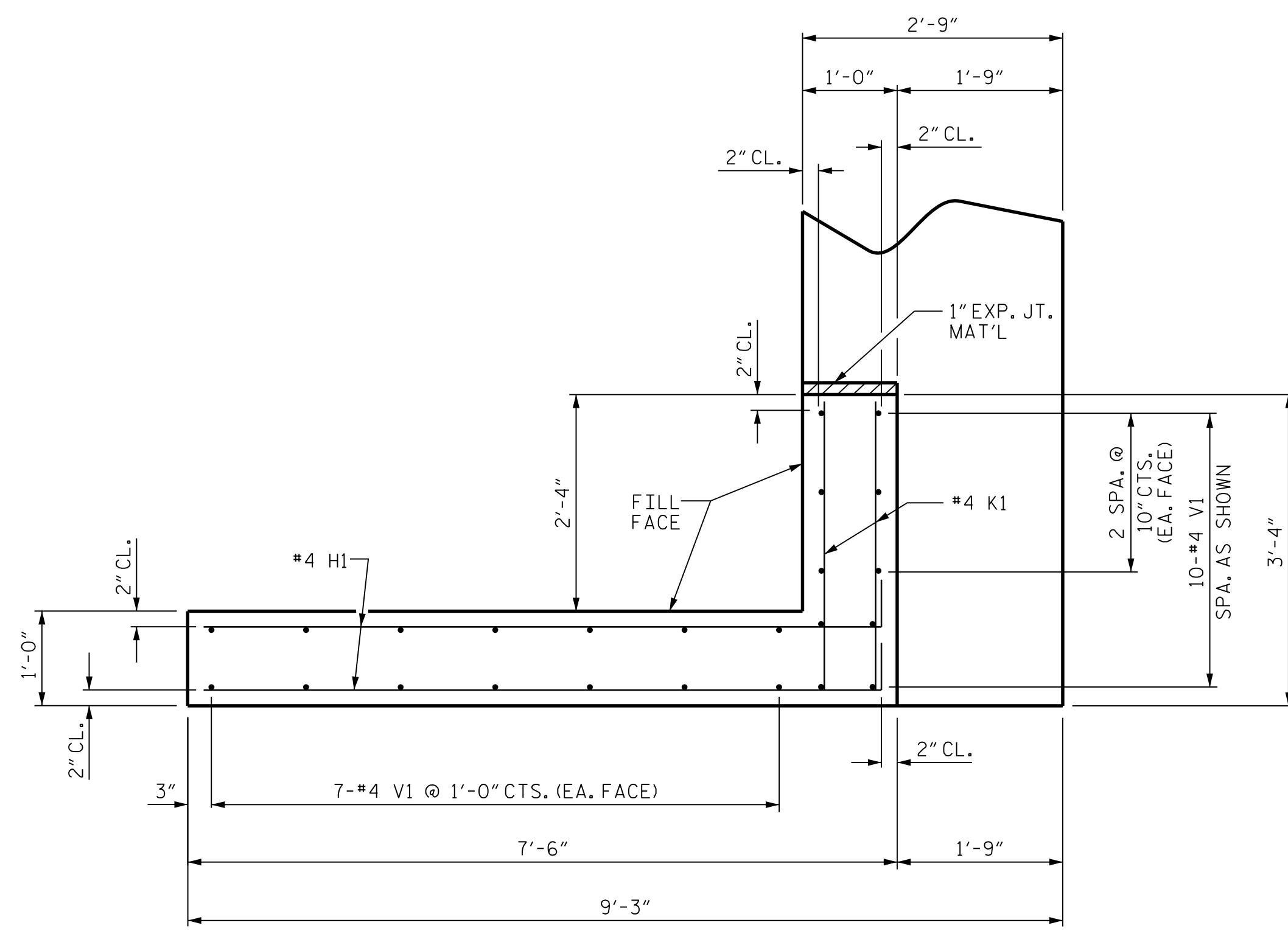
REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
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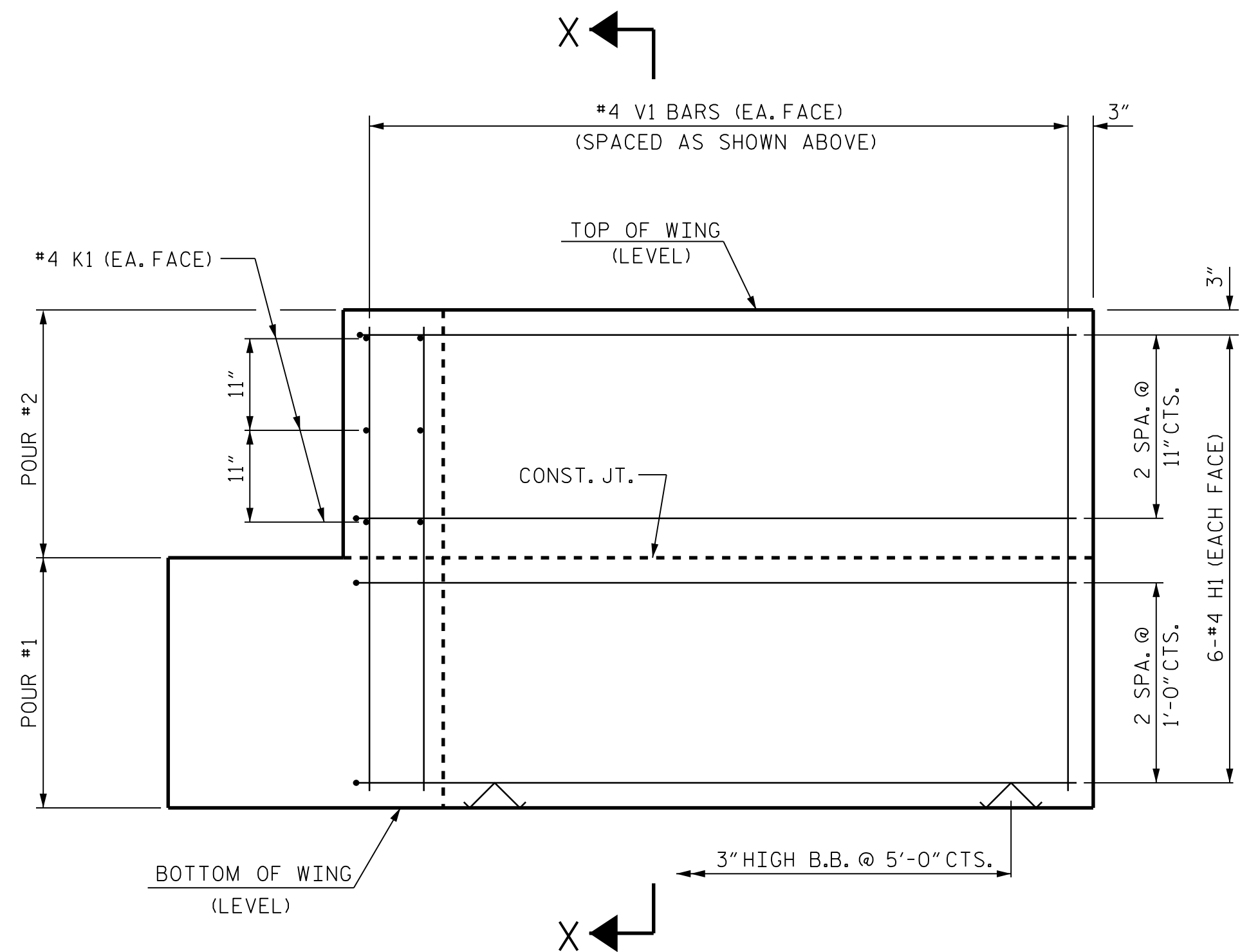
SHEET NO. S-10
TOTAL SHEETS 14



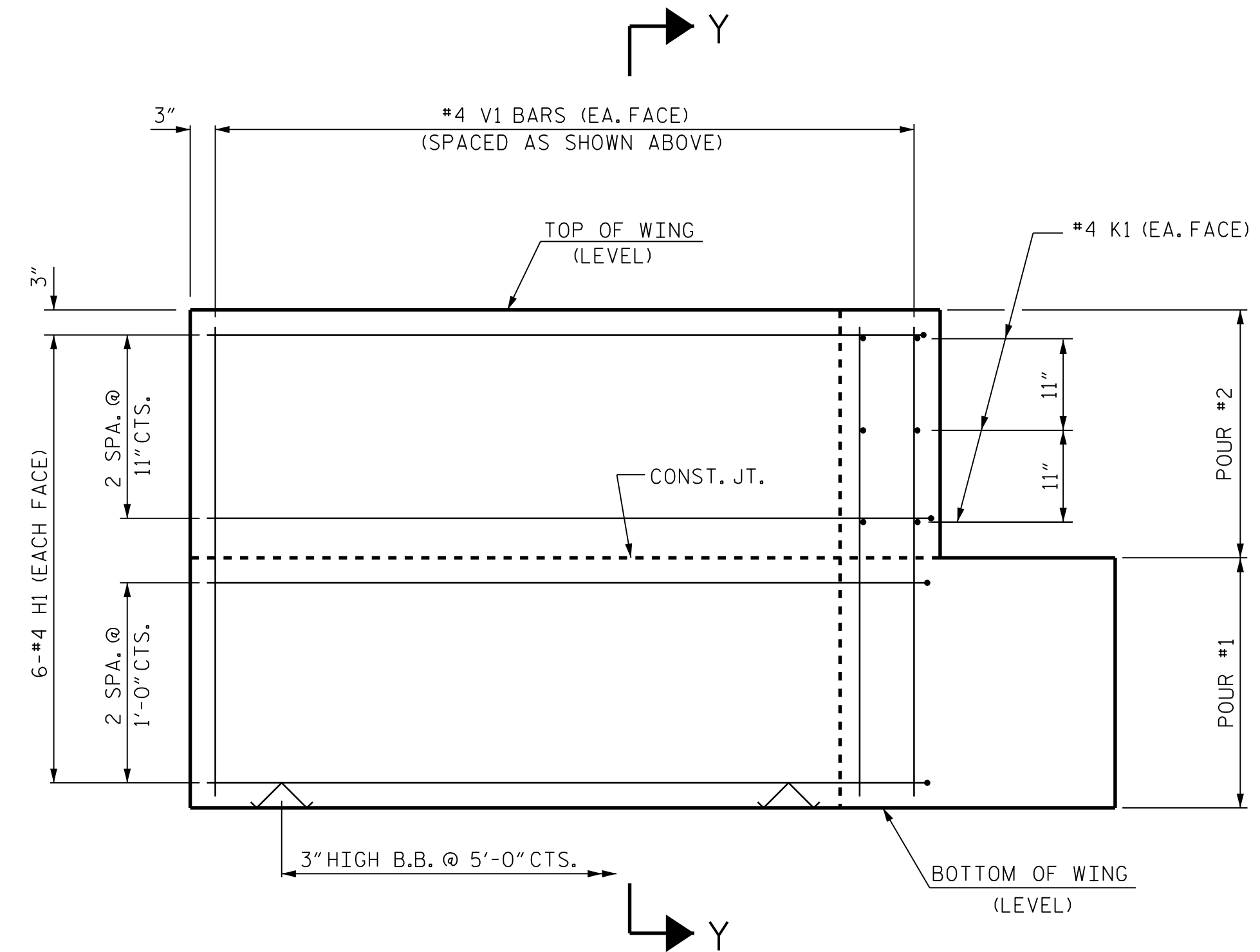
PLAN OF WING (W1)



PLAN OF WING (W2)

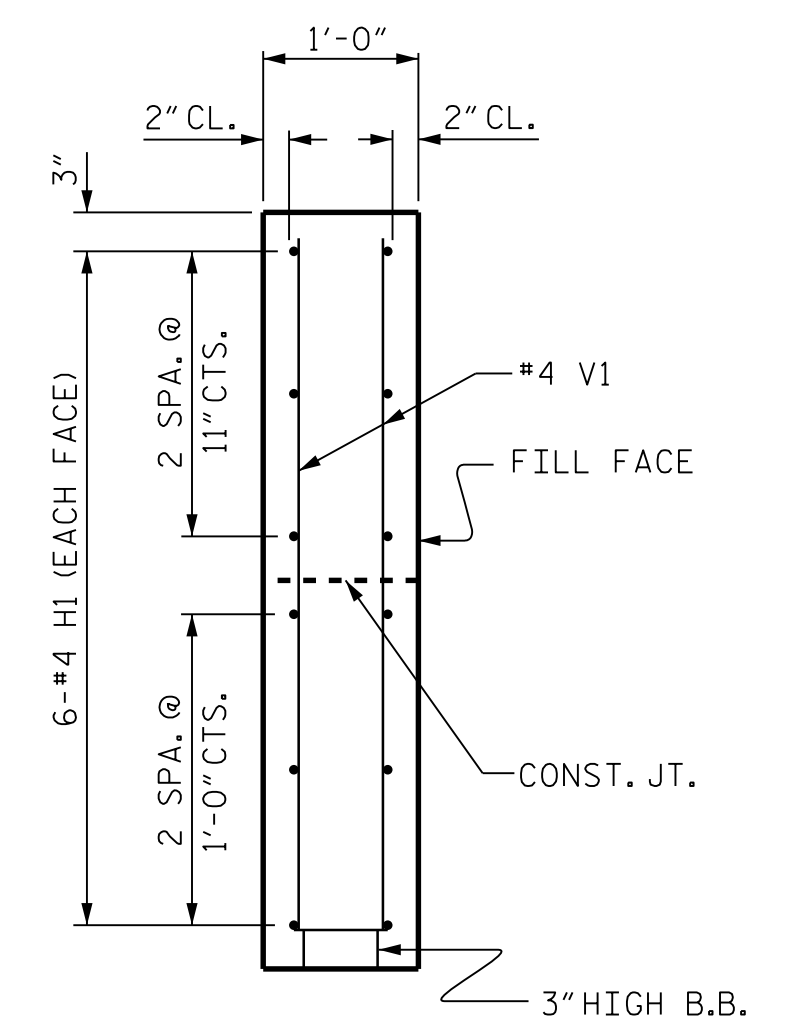


ELEVATION OF WING (W1)

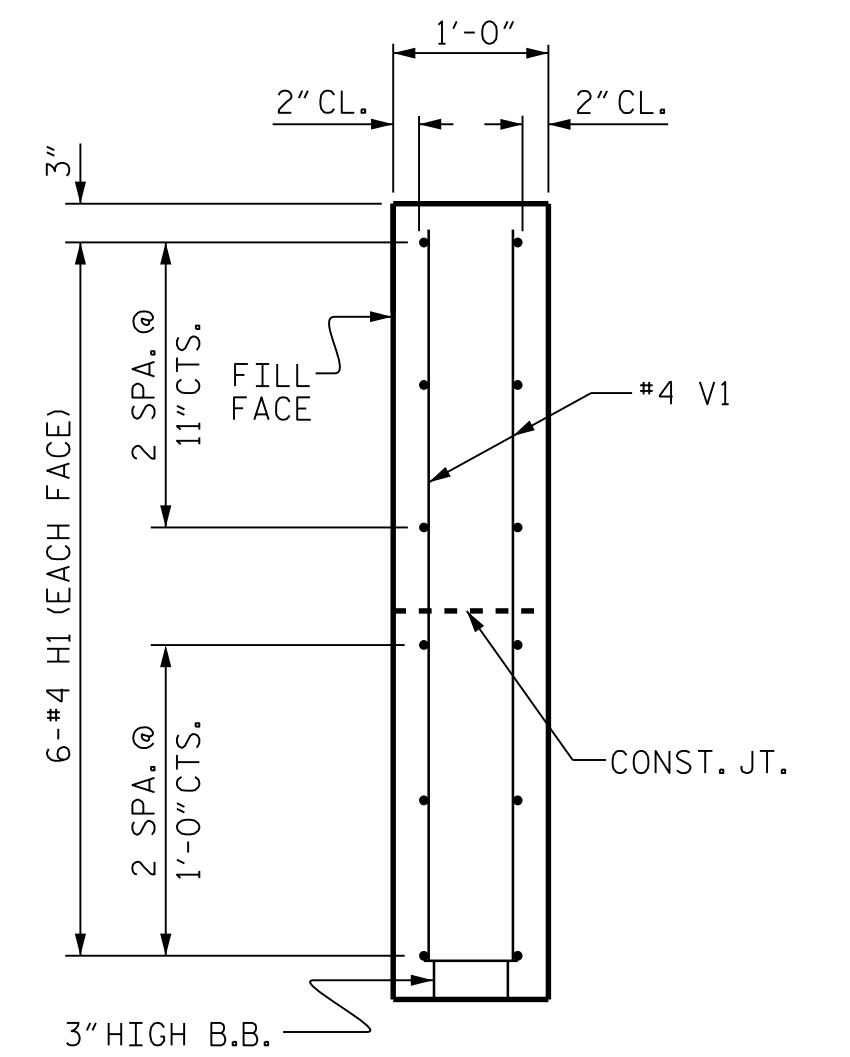


ELEVATION OF WING (W2)

WING DETAILS



SECTION X-X



SECTION Y-Y

PROJECT NO. 17BP.3.R.81
 BRUNSWICK COUNTY
 STATION: 14+60.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

END BENTS 1 & 2
 WING DETAILS

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

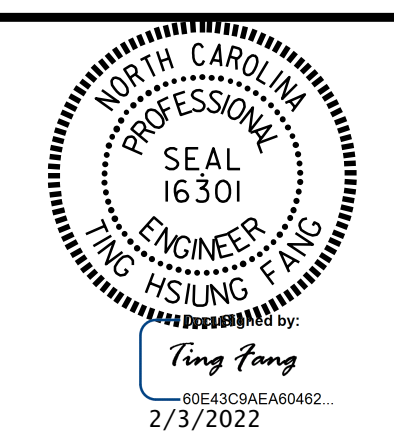
TOTAL SHEETS: 14

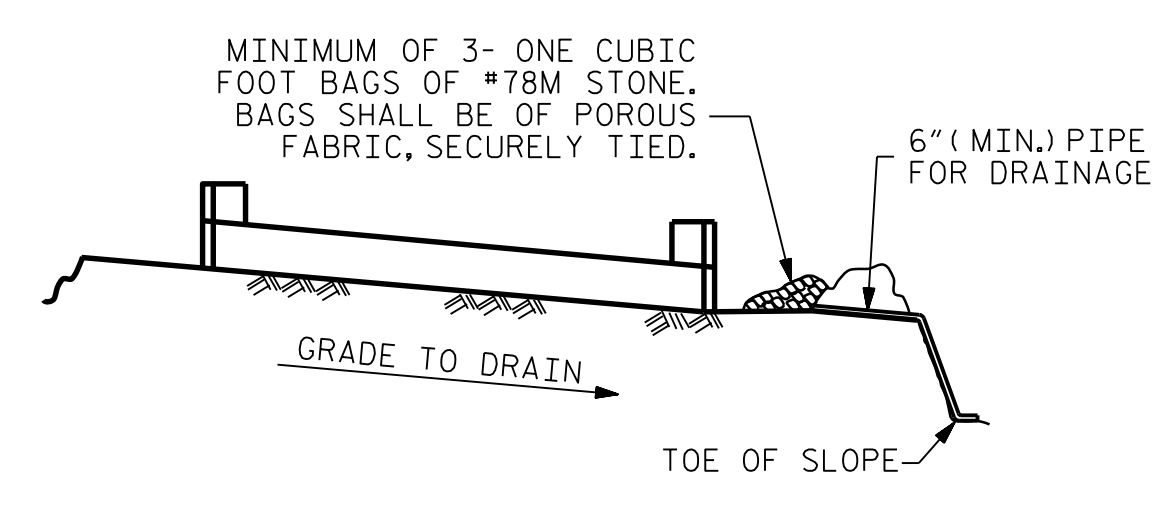
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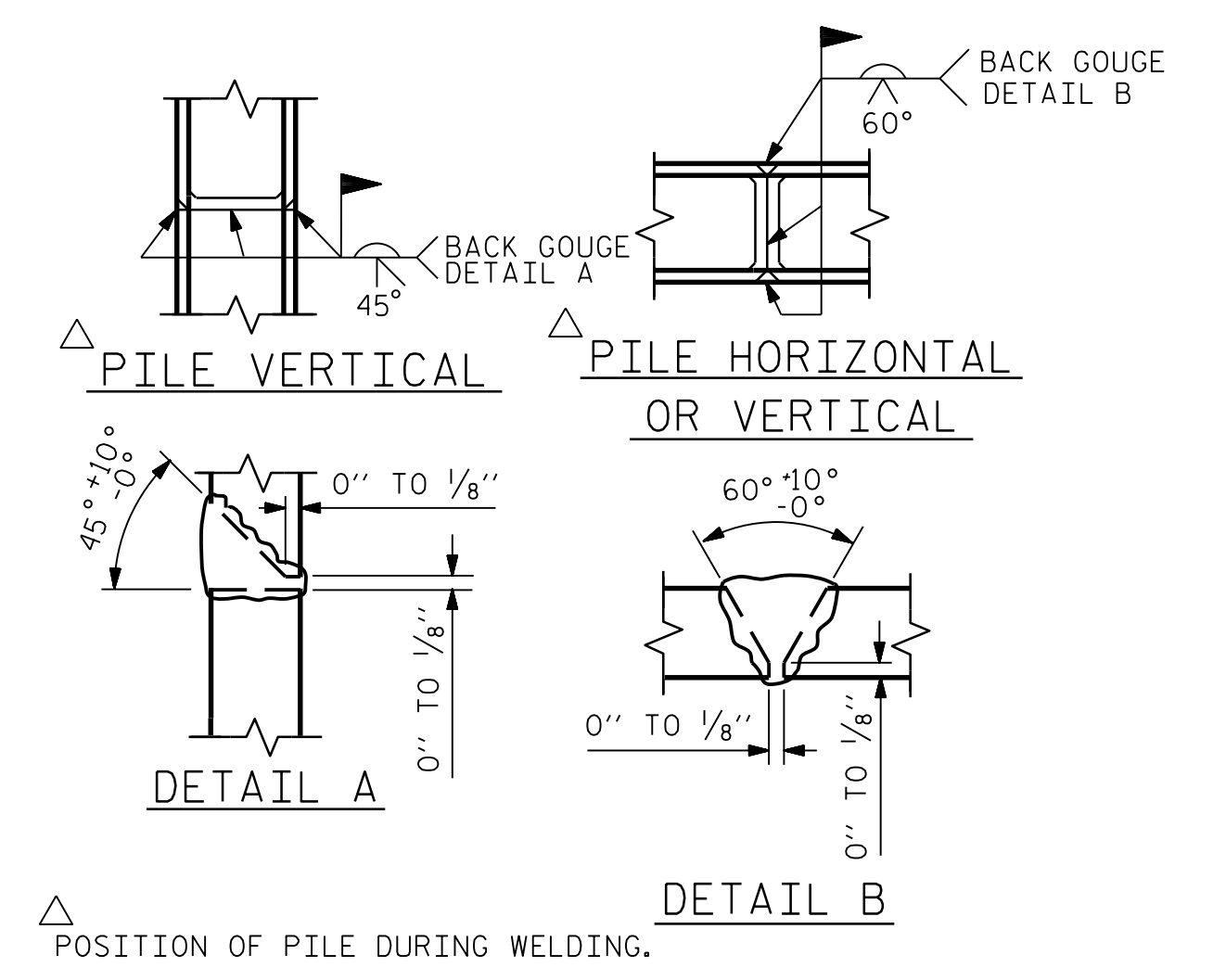


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

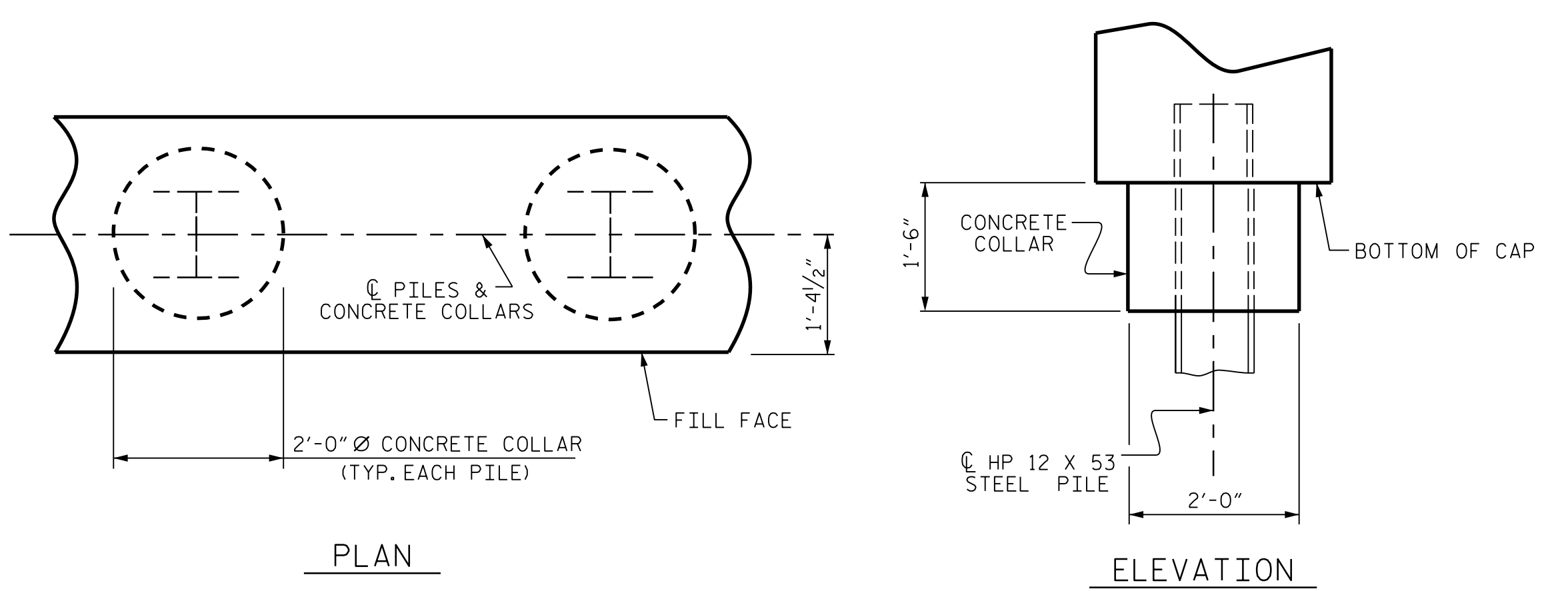
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

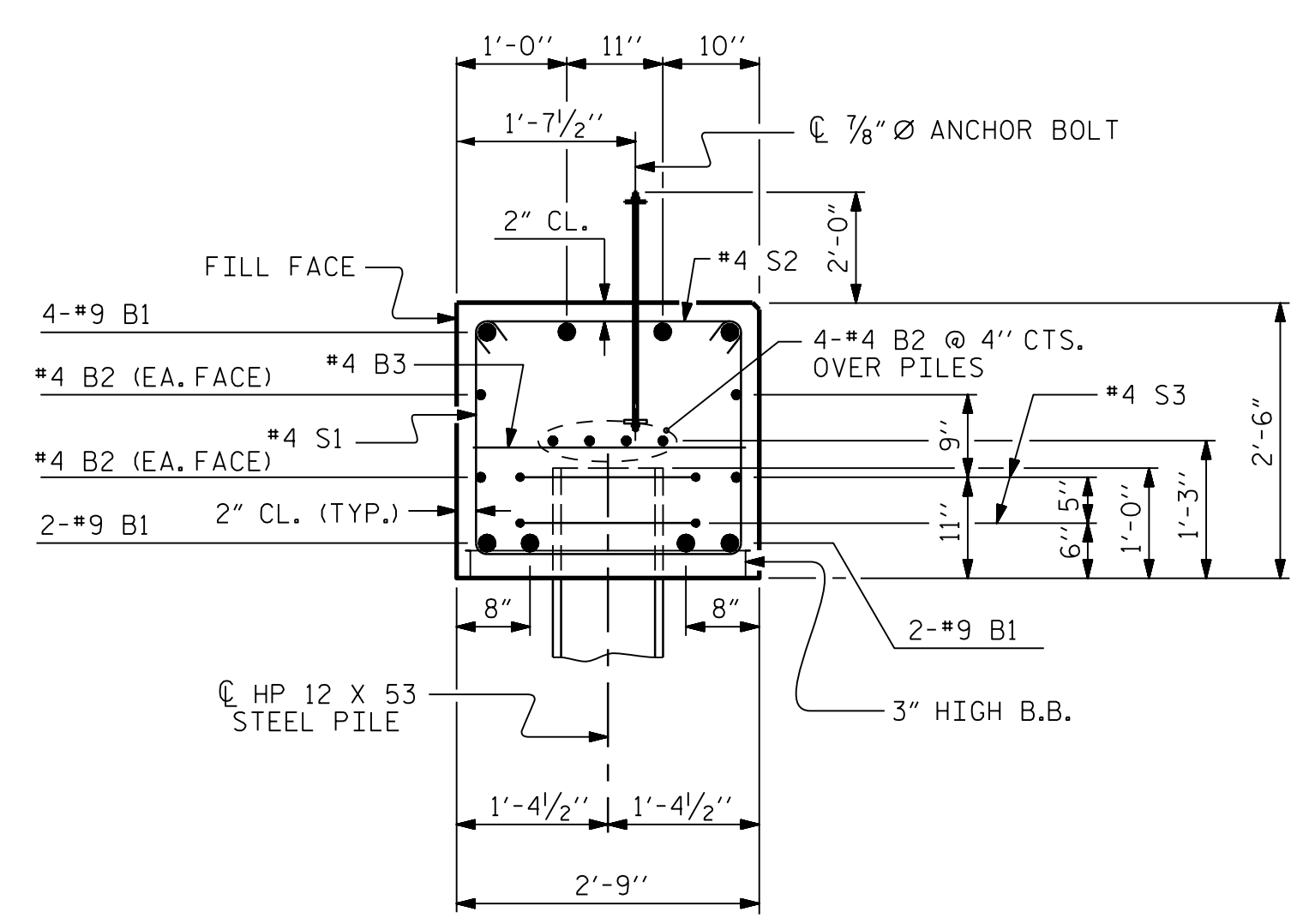
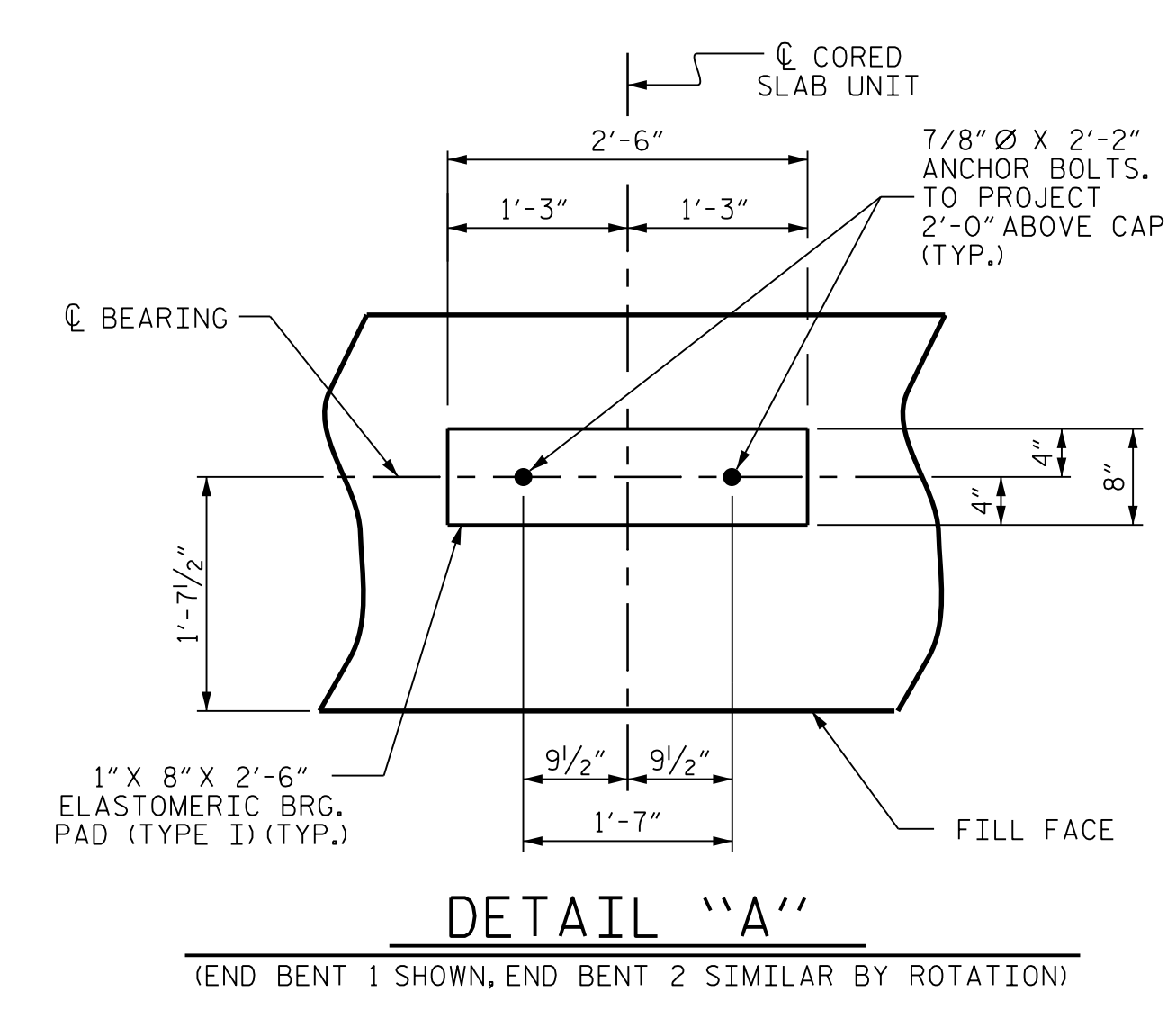


PILE SPLICE DETAILS

BAR TYPES						BILL OF MATERIAL	
						FOR ONE END BENT	
						(2 REQUIRED)	
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT		
B1	8	#9	1	41'-0"	1115		
B2	16	#4	STR	20'-7"	220		
B3	10	#4	STR	2'-5"	16		
H1	24	#4	2	7'-10"	126		
K1	12	#4	STR	2'-11"	23		
S1	50	#4	3	7'-5"	248		
S2	50	#4	4	3'-2"	106		
S3	14	#4	5	6'-6"	61		
V1	48	#4	STR	4'-11"	158		
REINFORCING STEEL						2073 LBS.	
CLASS A CONCRETE BREAKDOWN:							
POUR #1 CAP, LOWER PART OF WINGS & COLLARS						12.4 C.Y.	
POUR #2 UPPER PART OF WINGS						2.0 C.Y.	
TOTAL						14.4 C.Y.	
3/8" Ø ANCHOR BOLTS						EA. 22	
EMBEDDED WASHERS, NUTS & PLATES						EA. 22	
FOR PAYMENT FOR ANCHOR BOLTS, NUTS, WASHERS AND PLATES, SEE NOTE ON SHEET S-07.							



CORROSION PROTECTION FOR STEEL PILES DETAIL
(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)



PROJECT NO. 17BP.3.R.81
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SHEET 4 OF 4

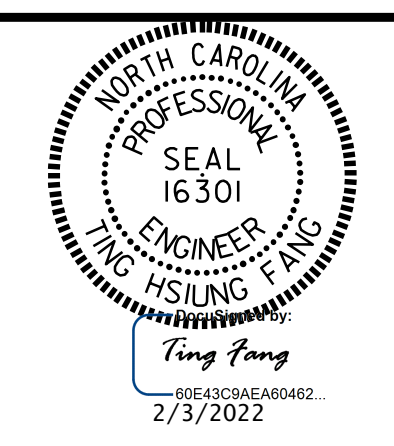
STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
SUBSTRUCTURE					
END BENTS 1 & 2					
DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-12
TOTAL SHEETS					14

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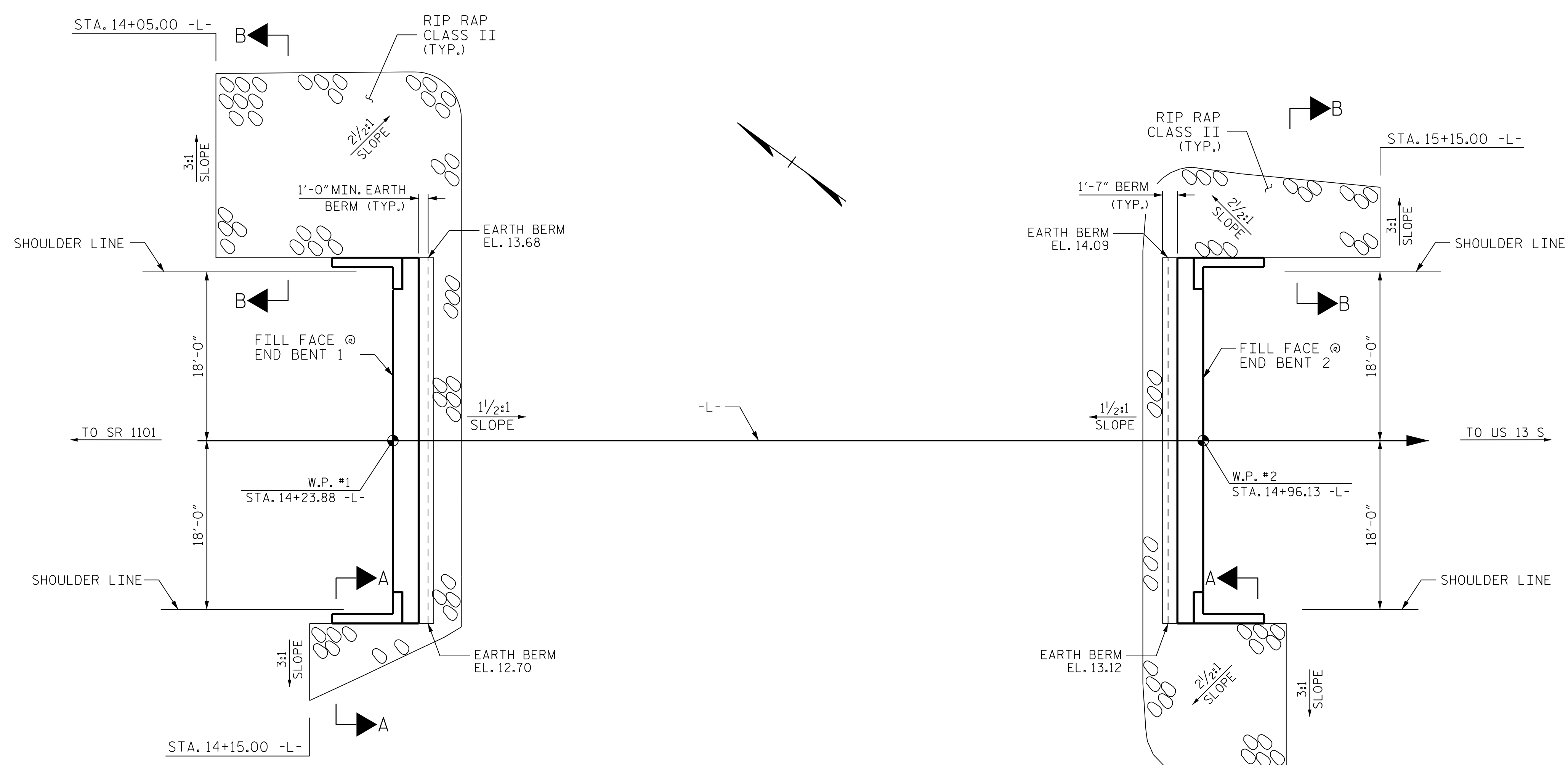
DRAWN BY: VDK DATE: 10/18
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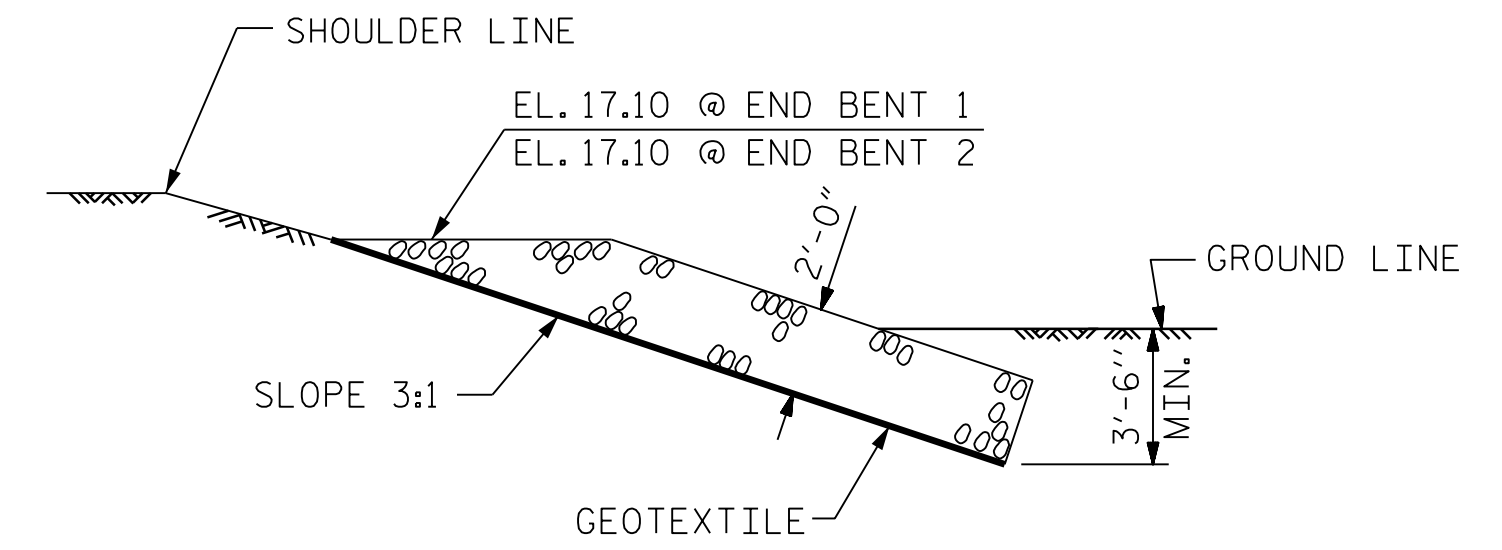


ESTIMATED QUANTITIES

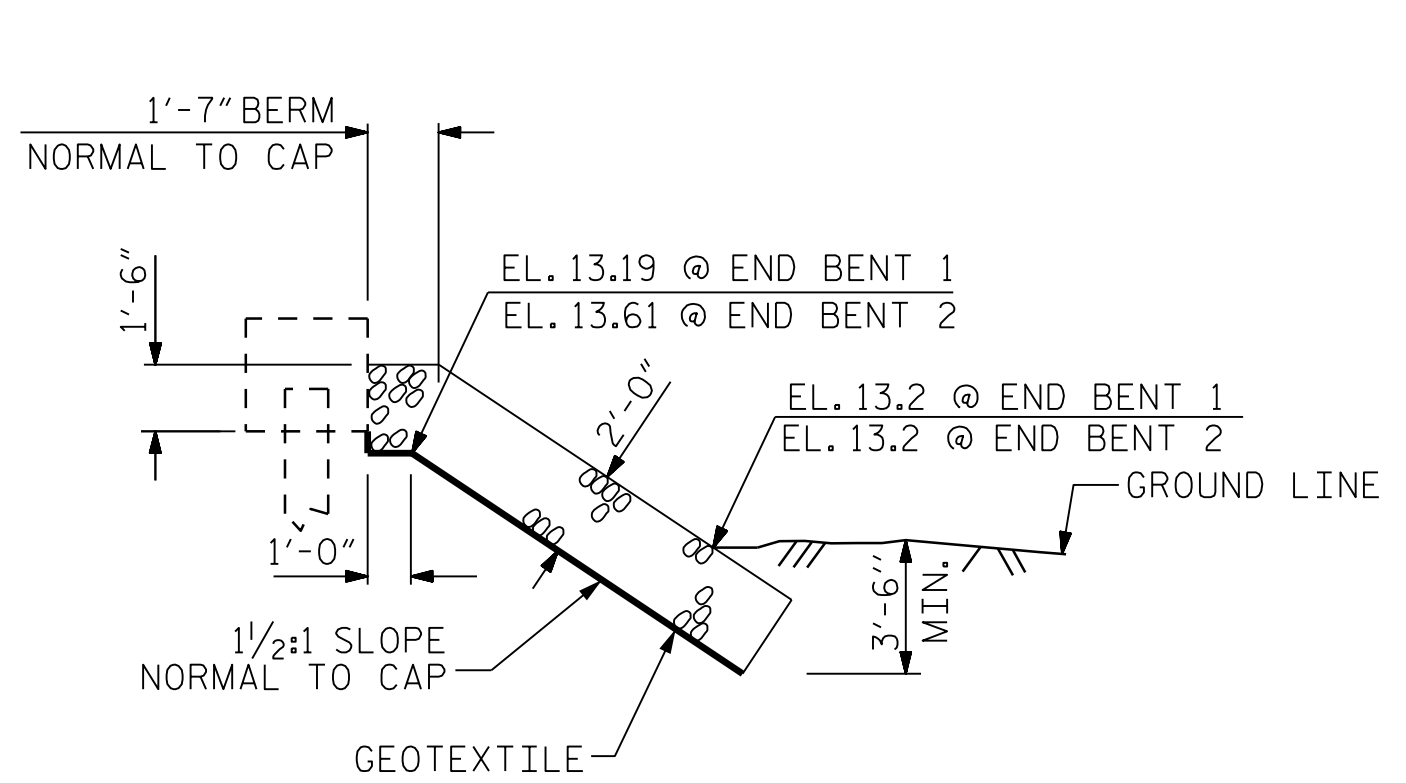
BRIDGE @ STA. 14+60.00 -L-	RIP RAP CLASS II	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	95	105
END BENT 2	85	95
TOTAL	180	200



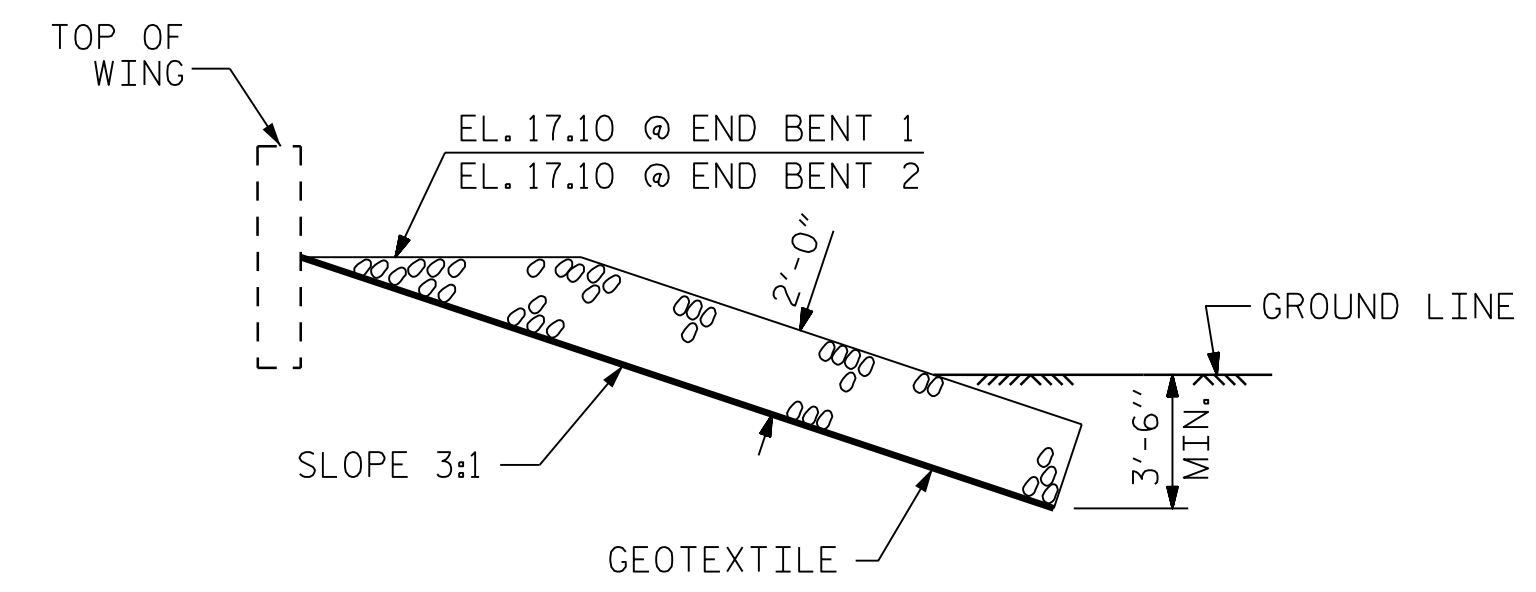
PLAN



SECTION B-B



SECTION @ END BENTS
BERM RIP RAPPED



SECTION A-A

PROJECT NO. 17BP.3.R.81
BRUNSWICK COUNTY
STATION: 14+60.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
RIP RAP DETAILS

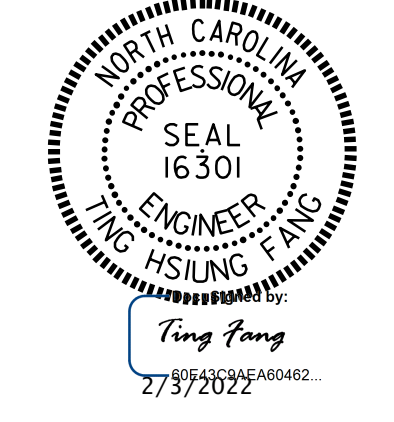
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			14

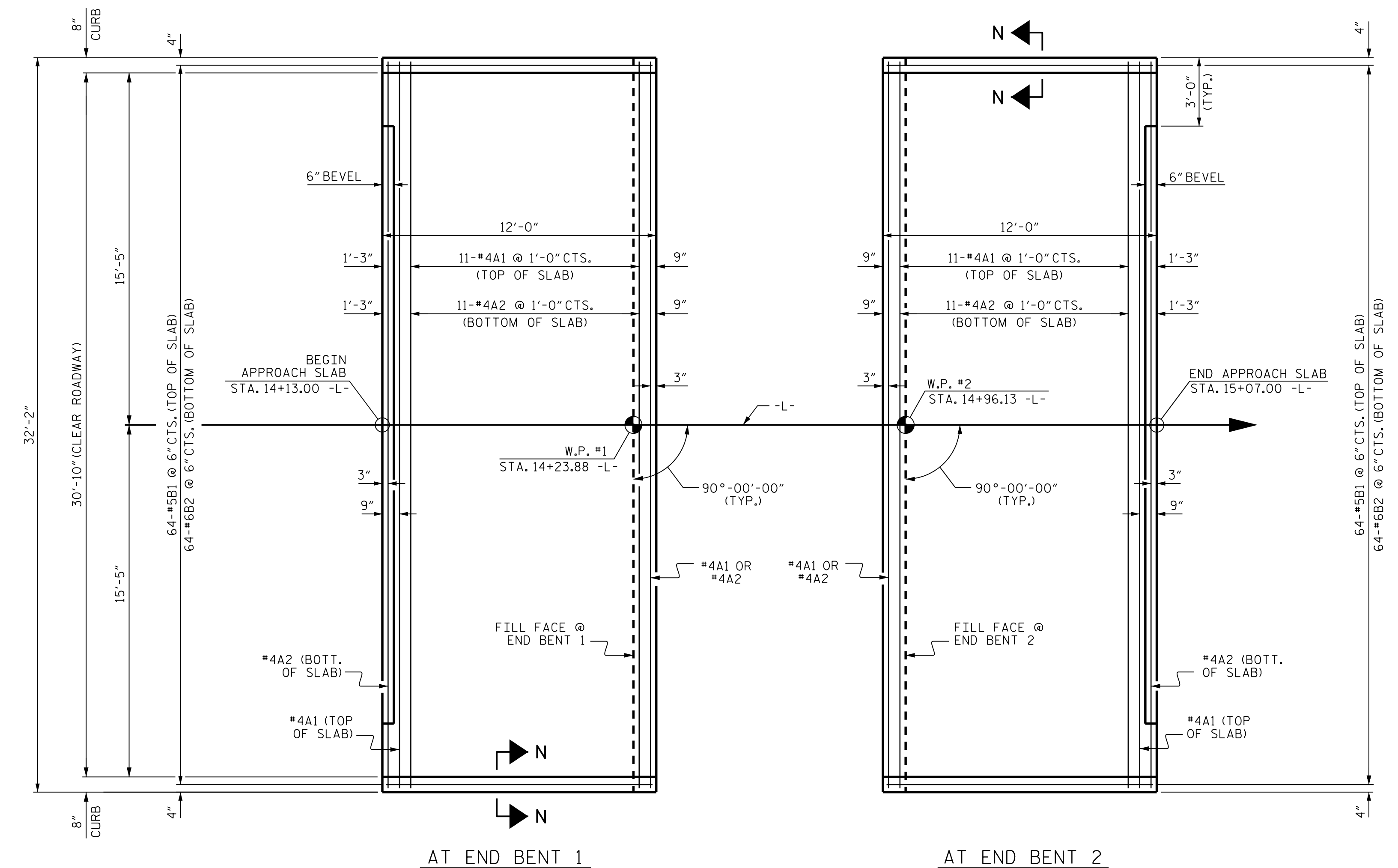
DOCUMENT NOT CONSIDERED
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PLAN
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

FOR BRIDGE APPROACH FILLS TYPE 5 GEOTEXTILE, SEE SPECIAL PROVISIONS.

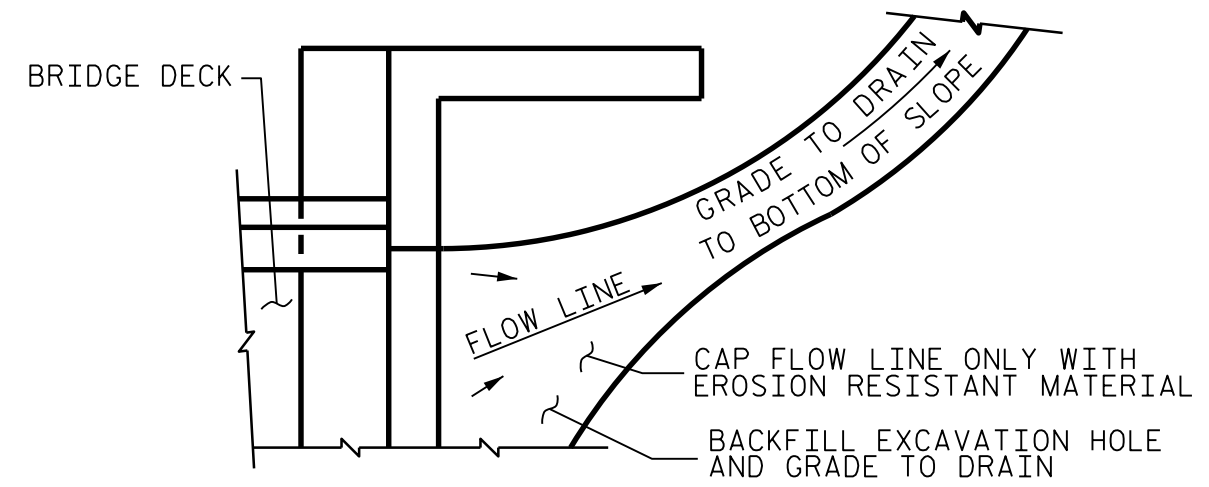
APPROACH SLAB GROOVING IS NOT REQUIRED.

BILL OF MATERIAL
FOR ONE APPROACH SLAB (2 REQUIRED)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	13	#4	STR	31'-10"	276
A2	13	#4	STR	31'-10"	276
*B1	64	#5	STR	11'-2"	745
B2	64	#6	STR	11'-8"	1121
REINFORCING STEEL				LBS.	1397
*EPOXY COATED REINFORCING STEEL				LBS.	1021
CLASS AA CONCRETE				C. Y.	19.5

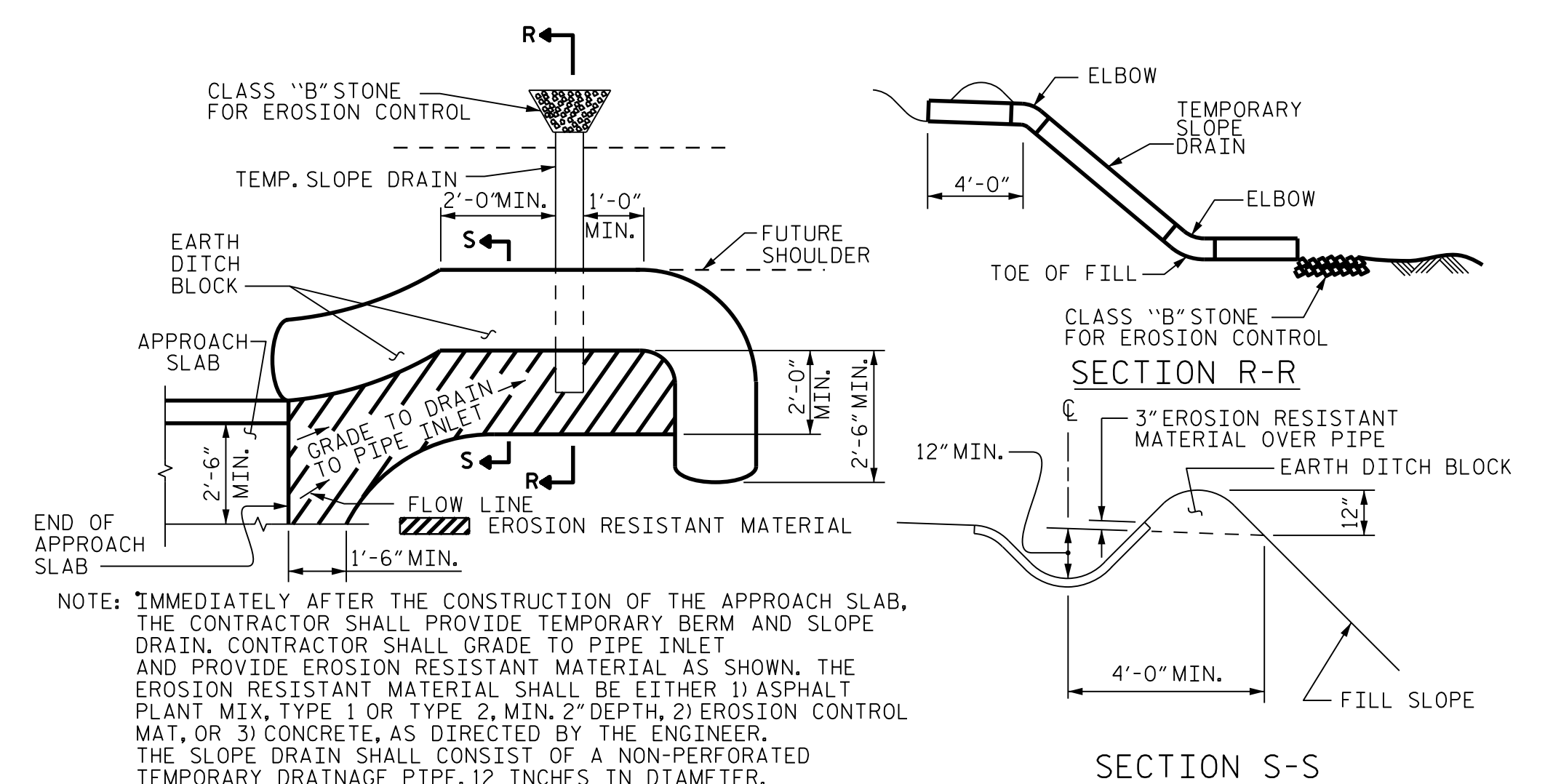
SPLICE LENGTHS

BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"



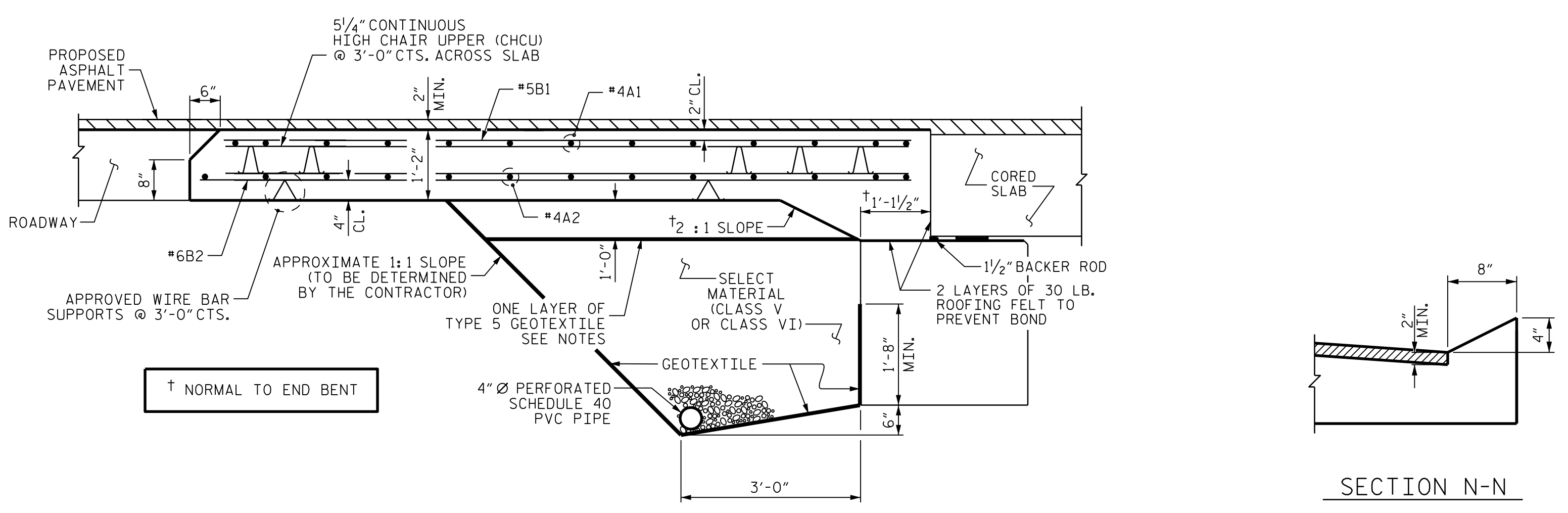
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAIL

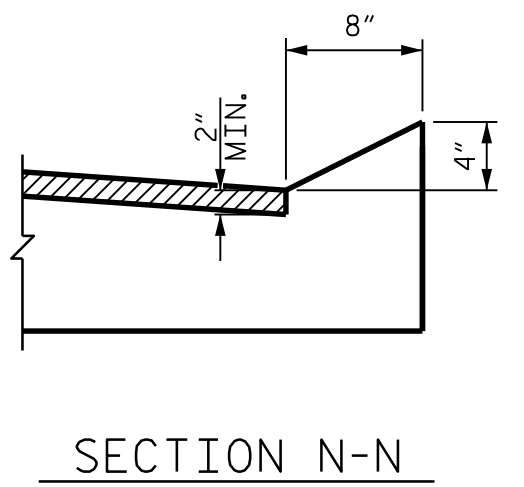


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

TEMPORARY BERM AND SLOPE DRAIN DETAILS
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION THRU SLAB
(TYPE II - MODIFIED APPROACH FILL)



SECTION N-N

PROJECT NO. 17BP.3.R.81
BRUNSWICK COUNTY
STATION: 14+60.00 -L-

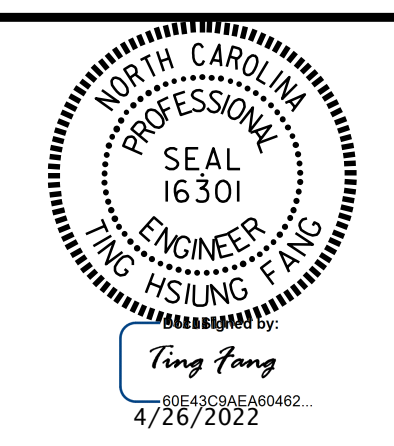
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
BRIDGE APPROACH SLAB
FOR PRESTRESSED CONCRETE
CORED SLAB UNIT
(SUB-REGIONAL TIER)
90° SKEW

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REVISIONS

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1			3		
2			4		

SHEET NO. S-14
TOTAL SHEETS 14

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	-----	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	-----	SEE PLANS
IMPACT ALLOWANCE	-----	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF		
STRUCTURAL STEEL - AASHTO M270 GRADE 36	-	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	-	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	-	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION		
GRADE 60	--	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	-----	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	-----	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR		
UNTREATED - EXTREME FIBER STRESS	-----	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	-----	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	-----	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.
ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.
IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.
DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.
WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".
EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.
WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.
METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH

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